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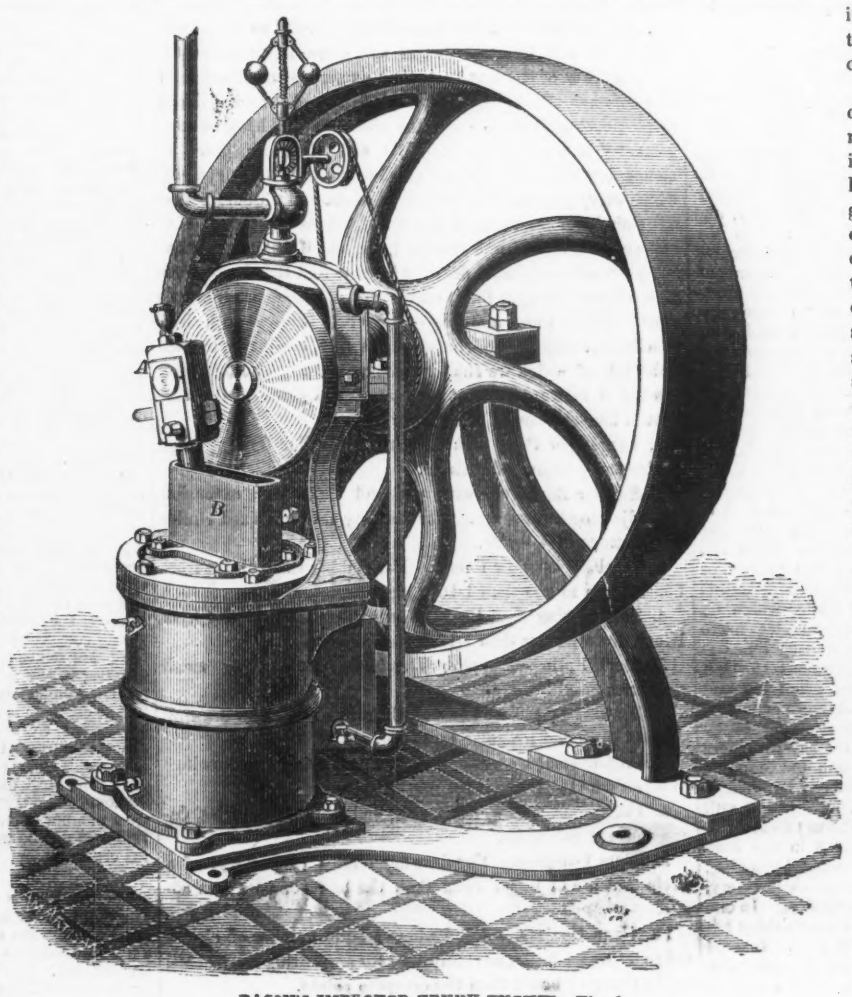
TRUNK ENGINES AND HOISTING MACHINERY.

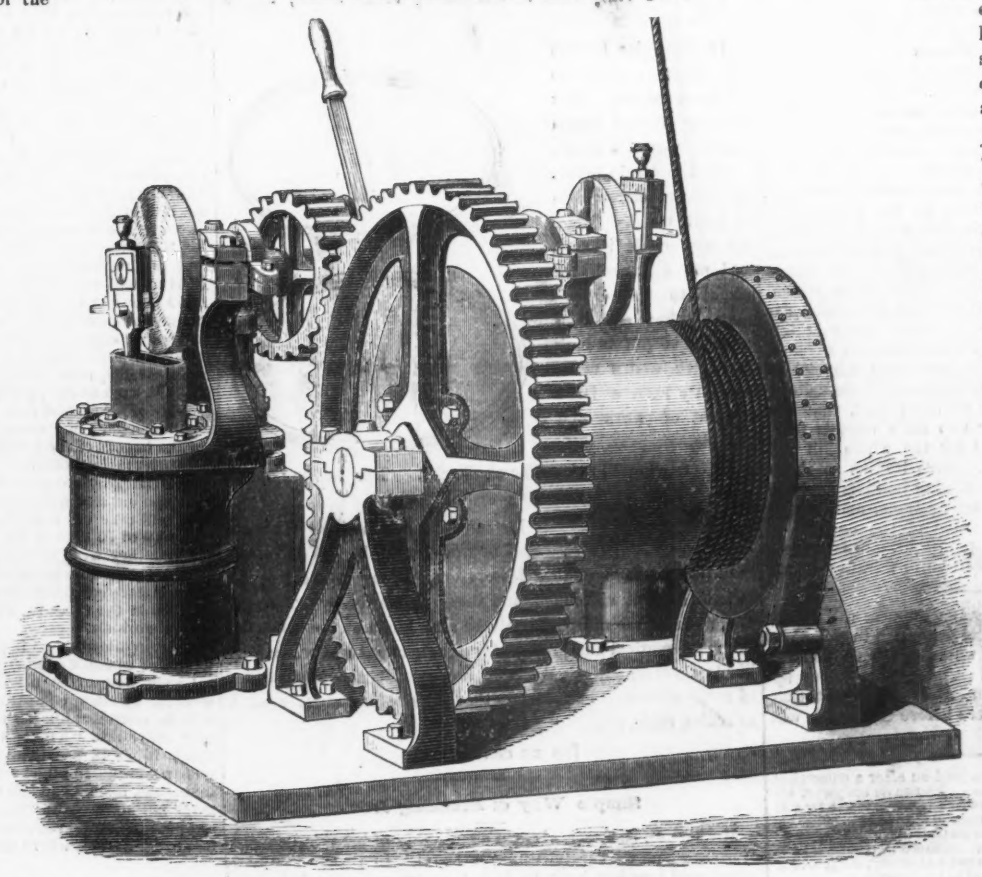
The annexed engraving, Fig. 1, represents an improved Trunk engine that is simple, compact and strong. It is usual in this description of engine, to have a hollow, cylindrical casing, or "trunk," which is fastened to the upper face of the piston, this casing being made to slide steam-tight through the cylinder cover, in the same manner as the piston-rod in an ordinary engine. The lower end of the connecting-rod descends through the hollow trunk to the upper side of the piston, to which it is jointed, the top of the connecting-rod being connected as usual with the crank-pin. Thus neither piston-rod nor parallel motion are required, since the connecting-rod has space to vibrate within the hollow trunk. The effective area of the piston is, of course, diminished by the area of the trunk, the surface of the piston within the steam cylinder being annular where the trunk is attached. By reference to the cut, Fig. 1, it will be seen and understood that the trunk, B, instead of being of the usual cylindrical shape, is made of oblong form in its horizontal section and in the direction of the lateral movement of the connecting-rod working through the same. By this means a smaller cylinder is required, and a greater area of piston is secured than in the trunk engines heretofore devised. This increased area of the piston of course ensures a proportionately greater stroke, which, in practice, is found to be more than twice that obtainable in the ordinary engines of this class.



BACON'S IMPROVED TRUNK ENGINE.—Fig. 1.

To provide for tightening the brasses, A, of the connecting-rod, this rod is made of strong pipe, with the stub and lower end welded on. Inside this is a rod, which fits between a small plate on the back of the inside box and the gib. By this arrangement, the boxes in both ends of the connecting-rod are simultaneously tightened. This description of engine can be made with a single cylinder or double cylinders. It has the ordinary eccentric, slide valve, governor, fly-wheel, etc., and is complete in all its parts.

Fig. 2 represents a combination of a steam-engine with a hoisting apparatus, a patent for which has been applied for, by E. C. Bacon, of the firm of Brooks & Bacon, who are the inventors and manufacturers of the machinery we here describe. This hoisting apparatus, like the engine, is simple and compact, is always ready for transportation, without taking to pieces, and can be set up and worked at very short notice.



BACON'S IMPROVED HOISTING APPARATUS.—Fig. 2.

The winding-drum is furnished at one end with a strong spur-wheel, which gears into a pinion placed loose upon the driving-shaft, but made fast when the machine is in use for hoisting, by means of a suitable clutch arranged upon the shaft just mentioned, and operated by a lever represented in the engraving as extending upward. The driving shaft is furnished at each end with a crank, to which is connected the piston-rod of an upright cylinder engine, such engine being preferably of the kind and pattern described above. By thus driving the shaft by power applied simultaneously at both ends, not only is all danger of wrenching the same when in use avoided, but, more than this, the cranks being arranged in positions at right angles to each other, any liability of their stopping at the "dead points" of the stroke is prevented, and injury and inconvenience provided against.

In the operation of hoisting, the power of the engine is exerted simply to wind the rope upon the drum and thus raise the load, it being only necessary to make the pinion loose upon its shaft, by throwing it out of gear with the clutch just herein described, in order to permit the reverse movement of the drum, to unwind the rope and bring the parts to their original position preparatory to another hoist. The too rapid movement of the same may be prevented by the action of a strap-brake, arranged upon or around a suitable disk or wheel provided upon that end of the drum opposite that at which the spur-wheel is secured, as shown at the right-hand end of the engraving, this brake being operated or forced in frictional contact with the periphery of such disk by a suitable horizontal lever.

In some instances where it is requisite to lower as well as raise the load, as, for instance, in working the elevators of hotels and other buildings, instead of connecting the driving mechanism with the winding-drum, as represented in the cut, the engines may be fitted with valves actuated by suitable reversing gear, so that the motion of the drum is reversed by the motive-power, and the load or elevator lowered with a regular and, if desired, a determinate speed. In other cases, where a portable hoisting device is required, it is proposed to place the entire apparatus, including the requisite steam boiler, upon a wooden platform supported by truck-wheels, so that the whole may be moved from place to place, and employed with the greatest facility for any of the purposes to which this class of machinery is commonly applied. This hoisting apparatus is suitable for stores, warehouses, mills, mines, quarries, etc., and for unloading coal and merchandise.

All further information may be obtained from the manufacturers, 450 West street, New York City, where also can be seen and obtained drawings of a hand-hoisting apparatus, on the same principle as the steam elevator, but worked by hand, with a crank. This machine is intended to hoist articles of considerable weight, and can be erected and used where steam-hoisting apparatus is inadmissible or not wanted.

Sun-Spots.

Before the Manchester Literary and Philosophical Society, at a meeting, held April 14th, 1868, Mr. S. Broughton said that, on recently observing with high powers a group of fine spots on the sun, one of which was of considerable magnitude, it occurred to him to remove the dark glass, and by keeping the eye much beyond the focus of the heating rays, and at such a distance that the spot almost filled the apparent field of the eye-piece, to see if any phenomena could be observed different from those seen through the dark glass. The spot was at once seen to be of a dark red; but thinking this perhaps might be from the strong contrast of color, he attached a disc of plaster of Paris to the telescope, and projec-

ted the image of the spot on it. On looking at this with a common pocket magnifier, the image was observed to be a dark blood red, although the observatory was not darkened, and the disc merely shielded from the direct rays by an intervening obaque substance. If these observations are confirmed, it will corroborate the opinion long held that the spots are not black, but appear so by contrast, and, as it would seem, from the intervention of the colored glass.

SENSIBLE IDEAS ON MINING METHODS.

In regard to "Reforms in Mining," the San Francisco *Bulletin* has advanced some ideas that cut into the heart of the matter. An application of system, economy, common sense and patience, in mining enterprises, is the main features in the important lesson taught him who has the opportunity to read the following lines, taken from the above mentioned journal. We gladly give space to them. They are just what are wanted, in order to help on the work of inaugurating a rational system of mining, in contradistinction to the fool-hardy, hap-hazard procedure, that has, in so many instances, left nothing but ruin in its track.

"Several of the papers published in the mining districts of California have lately urged the necessity of co-operation among miners in the testing and working of quartz lodes. The Amador *Ledger* suggests the formation of joint stock incorporated companies, with a capital of say $10,000, twenty per cent. paid up, to prospect new lodes, taking a mortgage or an interest in the lodes as security or payment on their investment. Such companies would be able to select experienced workmen, and prosecute the test economically, and miners would not, meanwhile, be losing their time. The Nevada *Gazette* adds to this suggestion that the rock extracted be crushed at a custom mill, by contract, till the company have a sufficient amount of money of their own to build a ten-stamp mill capable of ready enlargement when necessary. This plan, the *Gazette* intimates, would put quartz mining on an independent cash basis. We may add that the grand error in the business has been to invest largely, on borrowed capital, in extensive machinery and buildings, before the mine was well tested. The result has been in most cases, especially in Washoe, that the first great product of the mine, from the most accessible ore, has been swallowed up to meet costs, and that when the working became more difficult, the original owners were bankrupt. The most profitable mines, to owners of small means, have been those which have been so worked as to pay their own way and afford a sinking fund for better appliances, after the lode has been well tested. First the arastra, then the eight or ten-stamp mill, then the twenty or forty-stamp mill—all out of the earnings of the mine—such is the history of many of the best lodes in the State, which do not figure in the stock quotations, but have nevertheless made numerous fortunes. The failure of many promising lodes is due entirely to the peculiar anxiety of Californians to "get rich" in a hurry. Great risks are taken, and great reverses follow. With more patience, more care, and more economy, there would be far more success. The suggestion for co-operation in mining operations might be extended to placer mines, which are wrought with even less system and economy in many instances than lode mines. A placer can be worked in some sort without capital or co-operation. There are still surface diggings that can be worked by only one or two individuals with the humblest appliances. Operations in the deep gravel diggings, whether hydraulic, tunnel or cement crushing, cannot be so simply managed, yet there is too much desultory, irregular and inharmonious management nevertheless. In one small district there will be many small companies working adjoining claims on different plans at enormous cost. Instead of combining to dig a single great drain tunnel, for instance, and having a partnership in the tail sluicings, every company will run a separate tunnel, which may or may not be rightly calculated, and is quite as likely to serve only a temporary purpose as the permanent use intended. In a majority of cases it would make the difference between success and failure, if all the claims on one hill that are conveniently situated for one comprehensive system of working, were combined and held by pro rata shares and worked under an intelligent central management. The plan is entirely practicable. The only plausible objection is that some claims might be thought richer than others adjoining it; but all old miners know that the richer claim of to-day may be the poorer one of to-morrow, or *vice versa*, and thus in the long run, by the co-operative plan, there would be a fair average product with reduced expenses and speedier profits. The separate plan of working adjoining placer claims of small extent, has ruined thousands of fine fellows who would have been successful had they combined their interests and labors. We could cite particular districts, within our familiar knowledge, where eight or ten small associations have run as many different tunnels through hard rock, spending three to six years, and from $20,000 to 100,000 each in the work, living on hope, on small occasional earnings, and on loans, often finding in the sequel, that the tunnel was too high, and that one or two main tunnels from the right points would have sufficed for the whole hill and have cost far less time and money. Such lessons as these ought not to be disregarded, and the mining journals could in no way be more useful than in discussing them, and stating the practical reforms they suggest. One of the benefits of selling placer mining lands, as advocated in this journal, would be to compel more combination and system in working them."

One of the curious freaks of a recent earthquake at Virginia City, Nevada, is thus related by a local paper: "In the Cole tunnel, from which a large stream of water has been pouring for months, the volume was increased sixteen cubic inches by the earthquake, and the flow has been steady all day at that figure—coming out steaming hot, where before the water was cold.

☞ Gold prospecting in Siberia is carried on after a somewhat singular plan. The mines are an object of much attention on the part of the Russian government, and while it is opened free for any one to search for gold deposits in any part of the territory, the successful discoverer is obliged to report to the nearest government official, who apportions him a space of about four square miles, on condition that all the precious metal he obtains is to be carried to a government depot, where it is coined into money, the proceeds, less fifteen per cent. for expenses, being then paid to the discoverer.

☞ A new ventilating apparatus has been tried in a novel manner in the Prussian House of Representatives at Berlin. Three hundred men were supplied with cigars and ordered to smoke. At the end of three hours the temperature was raised but one degree, and the atmosphere was comparatively pure.

Practical Letters.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

LESSONS IN MECHANICAL DRAWING—No. VI.

BY T. P. PEMBERTON.

DRAWING TOOLS AND INSTRUMENTS.

In addition to the large bow pen or drawing compass illustrated and described in Lesson No. 5, there are several other instruments required in architectural and mechanical drawing, which may be always found in a complete set of first-class drawing tools. These the student can examine at the store of any mathematical instrument maker. We would again caution him, however, never to purchase inferior cases of instruments, but to select and procure such as are perfect in their joints and points, as these, with proper care, will last a lifetime. A full set, or a complete case of first-class instruments, is expensive, but each instrument can generally be purchased separately, and it is far better and more advantageous to possess a few of the best tools than numerous worthless ones. The common articles generally used in schools are not likely to please or encourage even the school-boy in his studies of geometry and mathematics. We will, therefore, give the names, and describe the use of those first-class instruments which every professional draftsman needs. We would first of all remind the student that these instruments are intended to make circles, curves, and straight lines, and if he will examine any piece of mechanical drawing he will find that it consists altogether of straight lines, curves, and a combination of the same. These lines and curves are first drawn with lead pencils, and then, when considered correct, are inked in with India ink, of which we shall speak hereafter. The following is a list of instruments that may serve as a guide to the student in his selection of the same:

1. Large Bow Pen, with attachments. For forming large circles and portions of a circle.

2. Smaller Bow Pen, with pen and pencil leg, extension bar, adjusting screws, etc. For drawing medium sized circles and portions of a circle.

3. Steel Spring Bow Pencil. For making small circles from 1 inch down to less than 1-16th inch diameter.

4. Steel Spring Bow Pen. For making small circles from 1 inch down to less than 1-16th inch diameter.

5. Steel Spring Stepping Dividers. For taking small measurements.

6. Drawing or Lining Pens, of different sizes. For drawing straight lines and irregular curves.

7. Proportional Compass. For transferring the drawings to an enlarged or reduced scale.

8. Protractor. For measuring and obtaining angles, degrees of the circle, &c.

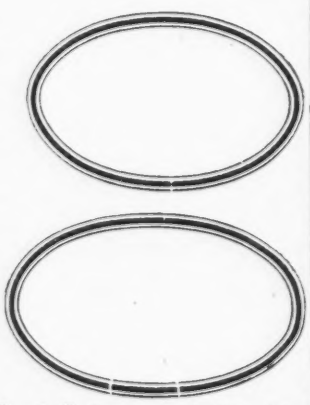
9. Beam Compass. For drawing circles or portions of a circle that are of larger radii than the bow compass will admit.

10. Horn Centres. Used where a large number of circles are to be drawn from one centre, and for preventing large holes, in the paper or board from the compass points.

11. Plain Ivory Scale. Containing small scales, angles, chords, &c.

12. Irregular Curves of different sizes, made of hard wood. For drawing curves which are not arcs of a circle.

13. Elliptical Curves, of different sizes, made of hard wood. These are now made in sets, and prove exceedingly useful to the draftsman. They are from 6 inches to ¾ of an inch in length, and if made correctly save a large amount of work and trouble.



14. Drawing Pins or Thumb Tacks. For holding down paper.

These are the principal instruments and articles that are found in every first-class case of drawing tools. We shall allude to them with further description, in our future lessons, but the student will understand them far better by examining and noticing the different qualities and kinds at the rooms of the mathematical and philosophical instrument maker, than by illustrations on paper. We shall, however, furnish illustrations of some additional instruments that require explanation, such as scales, rules, etc.

[TO BE CONTINUED.]

Simple Way of Breaking Iron.

Mr. Troost, engineer, gives a simple way of breaking a mass of iron, which we hardly think is novel. In a mass two feet square and four feet long, he bored a perpendicular hole one inch in diameter and between three inches and four inches deep. This he filled with water and closed with an accurately fitting iron bolt. One heavy blow on this bolt broke the mass into two pieces.

Mining Summary.

Idaho.

Gleanings from Ross Browne's Report.

BOISE BASIN.

Boise Basin is a very rich placer district, well timbered with forests of pine, and well supplied with water. Mining is in a prosperous condition here; the flumes are substantially built, and the hydraulics of the most approved construction. These mines were discovered in August, 1862, by a party from Walla-Walla, under the direction of a man named Grimes, on a branch of Moore's creek, not far from Centreville. In a few days after the discovery, Grimes was killed by the Indians; his party retreated to Walla-Walla, where they procured reinforcements, and, returning, built a fort about four miles above Centreville. There they remained through the winter. Soon gold was discovered on Granite creek, Elk creek and Moore's creek, the outlet to the water of the basin. The mines proving extensive and the gold evenly distributed, a great number of claims were speedily located, and they paid well. For the first year or two the miners did a good business. Timber and water being abundant, they were enabled to work their claims to the greatest advantage. The country rock is granite, and the gravel containing the gold has but little quartz, sand or boulders in it. Generally the quartz veins in the basin are soft: when detached and washed down a short distance in the stream, the quartz is finely pulverized and the gold liberated. In mills these ores are crushed with great facility. A large portion of the soil is stained red by oxide of iron, and contains a small amount of gold. The beds of the creeks and gulches have yielded well, and have, in some instances, been worked over as many as four times. Many of the streams have ancient beds of gravel, doubtless rich, below the present beds. On the sides and tops of the adjacent hills are masses of clay and gravel that yield handsomely. In some instances, as at Placerville, the miners come to a bed of clay, which has been mistaken for the bed-rock. On sinking a shaft through it, a rich stratum of gravel is found. Ditches from a mile to seven miles in length have been constructed in the basin, their capacity varying from 300 to 3,000 inches, costing from $10,000 to $30,000. Like the small ditches in California, they have paid the cost of their construction and a profit to their owners. Large ditches generally entail a loss to their projectors. Where a large amount of water is brought into a mining district, the mines, unless very extensive, are soon exhausted. Sixty to eighty cents an inch are the rates charged here for the use of water for twenty-four hours. In some of the hydraulic claims work is continued day and night, as few or no companies have reservoirs. Where lumber is so abundant the creek and gulches ought generally to pay to flume. Want of fall is probably the reason why many of them have not been flumed. By the use of similar machinery to that recommended for Alder gulch, in Montana, fluming would be rendered profitable in some cases where it is not now used. Except in the construction of flumes, placer operations in Boise Basin are conducted with considerable skill. Quartz mining has been conducted with different degrees of skill and with varied success. One company called the Elk Horn is composed of four miners, who all work in the mill and mines, giving constant personal supervision to both, and although their ore is not richer than that of other mines, and their mill nowise superior to the ordinary mills of the country, their enterprise has been uniformly successful. The Elk Horn is a small vein a foot to eighteen inches in thickness; the mill in the same ratio, having only five stamps. This correspondence of the mill to the actual resources of the mines is doubtless a prominent cause of success. The best yield which has been obtained by the company from large amounts of ore is $40 per ton, which, with their economical management, affords a good profit. On Granite creek are a number of veins with quartz so soft that two-thirds of the vein stuff can be washed in a common rocker without any previous crushing.

THE ORO FINO MINE.

The Oro Fino is one of the most productive mines in Idaho. The vein is large and well defined, and the gold generally diffused through the vein-stone. It was discovered in following up a placer deposit to the vein, on each side of the ridges in which it is situated. The first work done upon it as a quartz mine was by Moore and Fogus, who took a large amount of ore from near the surface, which paid handsomely. Becoming involved in other enterprises, they failed, under a heavy indebtedness to their workmen. By an arrangement with other creditors the workmen took the mine, agreeing to pay a certain proportion of the proceeds. Moore & Fogus left it in bad condition for working, and the men who undertook to work it had but limited means. By perseverance, however, they paid off the debt; then opened the mine deeper than it had been opened before, and found a great increase in its richness. The company is known as the "Oro Fino and Morning Star." A recent crushing of 80 tons yielded $160 to the ton; and it is probably now paying the owners a good profit. At a meeting of the stockholders held on the 17th of September last, an elaborate report of the mine was presented, from which the following is extracted:

"Work was commenced in the mine April 28th; since which time two shafts have been sunk of 92 and 67 feet respectively; 1,134 tons of ore have been taken out, and up to the 15th inst. 2,050 tons had been crushed, which yielded $54,193. The total amount of expenditures in working the mine, including repairs, incidental expenses, etc., amounted to $45,508, besides other liabilities amounting to $12,476, from which must be deducted about $8,000, value of supplies on hand necessary for supplying the mill, such as fuel, quicksilver, oils, acids, etc., including 7,000 pounds of shoes and dies. The company by-laws were revised and amended; one amendment allows the trustees to expend, for the benefit of the company, any sum under but not exceeding $100,000, instead of $15,000 as heretofore. Altogether, the affairs of the company are in a very healthy state. They are now ready to slope out and work a new level of 70 feet, and consequently they will take out much larger quantities of ore than before. A clean-up of 70 tons of ore last Saturday yielded $10,327, and to morrow they will probably clean up nearly as much, which, added to the amount above reported, will make an aggregate yield of above $75,000 since the 28th day of April, leaving about $25,000 in the treasury, with everything in good condition for future working."

It is singular that so few mines are owned and worked by companies of operative miners, especially when we see how successful such companies usually are. Nearly all placer mines are worked by such companies, but when a miner works a quartz vein he considers himself relieved from manual labor. The popular belief that "a mill is required to work a mine" has had much to do in preventing companies of miners from working quartz mines. In all extensive mining districts where mills are numerous, miners can sell their ore for all it is worth. Men who make milling their business can manage it better than those who are both miners and mill men. We see the beginning of this system in California, where the concentrated sulphurets are sold.

POORMAN.

As this mine is, in its location, adverse titles, legal difficulties, and local characteristics, peculiar, it will be described somewhat at length. The Poorman, or Hays & Ray mine, was discovered in the summer of 1865, at or near what is now called the Discovery shaft, about 900 or 1,000 feet south from the rich chimney,

The ore at this point was good, though not rich, and the vein somewhat small. While the discoverers were developing their veins, a prospector named Peck found some very rich float-rock about 1,000 feet south of their shaft, and out of sight from its entrance. By a small amount of digging he reached the vein, which he carefully covered over with earth. Gathering up and secreting every rich piece of float he could find, he went where the discoverers of the Hays & Ray were at work, and after "talking round," asked them where their claim was located, and how far it extended in each direction. They showed him their boundaries, and walked directly over the spot where Peck had buried the vein, and such a distance beyond that he was convinced their claim embraced the rich ground. Peck continued to prospect in that vicinity, and cautiously commenced negotiations for the purchase of the mine. Not being satisfied with their figures, and there being few or no prospectors in the neighborhood, he left for a few days, thinking his absence would cause the owners to come down in their price. Before he returned, another company of prospectors found the same spot discovered by Peck, called it the Poorman, and took out silver ore of great richness. Hays & Ray claimed the ground, but as their vein was not uncovered or traced to the new opening, the Poorman company refused to leave, and as the Hays & Ray party had no money to pay for provisions or tools while they were tracing the vein, they gave Peck a share in it for tracing it from their opening into the Poorman. The Poorman party, seeing that they would become involved in litigation, associated their company with some capitalists connected with the Oregon Steam Navigation Company, and about the same time or shortly before erected a fort at their mine, called Fort Baker, built of logs, with portholes and other means of defence usual in such cases. The Hays & Ray party had their work so nearly completed that they could commence suit, but could not give the necessary bonds. Acting by the advice of Peck, they gave a portion of their interest to the New York and Owyhee company, the latter guaranteeing to carry the suit to a decision. Before trial a compromise was effected, the New York and Owyhee party getting the larger share. The Poorman, at the start, had the great advantage of possession of the paying part of the mine. The strike of the vein is due north and south; the dip at the surface was to the west, but at the depth of about 150 feet it changed to the east, which is probably the permanent dip. The Silver Cord, which is supposed to be on the same vein, at a depth of near 1,000 feet below the Poorman, has also the same dip. A change takes place in the character of the ore, as is usual when the dip changes. A large amount of unnecessary work has been done on this mine; one shaft sunk near the office would have been all that was necessary; but when claims are in litigation much useless work must be done to prove identity of vein. The vein staff is soft; a great portion being silicious clay that will dissolve in water. Ordinarily a mill will crush two tons to the stamp in 24 hours. It shows considerable free gold. The sulphuret ores are decomposed except where found in large masses. At the depth of near 250 feet the greater part of silver is in the form of a chloride. About 100 feet from the surface a body of ore showing partially the planes and angles of a crystal of ruby silver was found, which weighed over 500 pounds. Upon being fractured it showed through the mass a uniform crystalline stratum. There is probably no second example of a similar mass of crystalline light-red ruby silver ore being taken from any mine. A piece of this boulder was sent to the Paris Exposition last year, and received a premium of a gold medal. Chloride of silver, or horn-silver, is found in pure masses, with crystals of remarkable size and beauty. It is said sheets of this ore were found more than a foot square and the sixteenth of an inch in thickness, some weighing many pounds. Black sulphurets of silver, or silver glance, is common in the mine; also palybasite. The above enumerates the ores of the mine, but it contains also small amounts of the various silver-bearing minerals usually found in rich silver mines. These are generally more interesting to the mineralogist than useful to the metallurgist, by reason of their small quantities. It is impossible to estimate with accuracy the amount of bullion obtained from the earliest workings of the mine. For a period of three months, from July 23, 1866, to October 23, we have a full account of its operations. The previous work on the mines, pending the litigation, had exposed large bodies of ore, but the working parties were enjoined from removing them.

The net yield of the ores from this mine is wonderful, and is due mainly to their richness. A large amount is left in the tailings. The managers are perfectly aware of this, for at the company's mill, by a well arranged system of reservoirs, all the tailings are saved, so that when the water leaves the last reservoir it is clear and can be used over again. This mill is well constructed and conveniently arranged. The ore is crushed wet and is amalgamated in pans. This collects the free gold, the silver from the chloride of silver, and a portion from the silver glance; but the gold from the sulphurets, and nearly all the silver in combination with sulphur, remain in the tailings. It would probably be unwise to remove the present mill, but in case of building a new one it would be advisable to have it as near to the mill as practicable. Last year the cost of hauling from the mine to the mill was $6 50 per ton, a very heavy and unnecessary expense. The Poorman vein shows but few marks of movement on its walls, as might be inferred from its nearly vertical position. It is probable that no faults of great extent will be met in working it. The vein in the widest part is three feet or more, but its average thickness, from the shaft of Hays and Ray, (as shown in the lower tunnel,) for a distance of 1,100 feet north, is not over a foot. Near the southern end of this tunnel is evidence of another chimney, not so rich, however, as that in the Poorman shaft. Doubtless many more may be found. These, however, are the only chimneys yet developed. The great richness of this vein has caused its examination by many speculative men who never saw a mine before, and who considered that each vein exhibited something miraculous. But nature operates by unchanging laws, and if these gentlemen had examined other mines they would have found the same forces producing the same effects, and have saved themselves the trouble of inventing useless and ridiculous theories.

PROSPECTING.

All miners are prospectors to a certain extent, but in all mining communities on the Pacific slope there is a class whose sole business is to prospect for new mines. By long experience these men acquire a degree of skill that appears like instinct. As far as they can see a mountain they can determine with great accuracy the probabilities of its containing metals of value. If the hills are smooth and the points are rounded off, placer gold may be found, but not where the hills are bare rock with sharp angular projections. If it is granite, slate, porphyry, or limestone, metalliferous veins may be found, but if the rocks are volcanic it is useless to look for anything valuable where it prevails exclusively. The color of the earth is also an important consideration; over a metalliferous vein there is usually a strip of the earth, about the width of the vein, different in color from the surrounding earth.

The outfit for either quartz or placer prospecting is the same, except a difference in tools. Sometimes a single man goes, but usually from 2 to 12 men go in a company; the latter number only in a hostile Indian country.

Each man has a saddlehorse, and every two or three men a packhorse for the purpose of carrying their provisions, cooking utensils, mining tools, and blankets. In very stormy weather a tent is sometimes added to the outfit.

Cooking utensils consist of a camp kettle, coffee-pot, frying-pan, tin cups, and knives. The food is bacon, beans, self-rising flour, sugar, and coffee. These, with a Colt's revolver, Henry rifle, or a double-barrelled shot-gun, constitute the armament.

A properly organized party will subsist for months at a time, and traverse a country hundreds of miles in extent without fresh supplies.

For placer prospecting the tools are a pick, pan, shovel, and axe. For quartz or vein prospecting, a palepick, (pick at one end and a hammer at the other,) shovel, horn spoon, iron mortar, magnet, and eyeglass, a few vials of acids, ammonia, and solution of salt, and some mattrasses and test tubes. When the prospector can use the blowpipe he always carries it, with a few reagents. The use of the pick and shovel is too well known to require description. The mortar is used to reduce the rock or ore to a fine powder, which is worked in the horn spoon to test it for gold. Very minute particles of gold can be detected in this manner, especially where a magnifying glass is used. The eyeglass is also useful to examine pieces of rock.

If the rock is suspected to contain silver, it is heated in a fire to as high a degree as the means in a wild country will admit, and if very rich the silver melts and forms in globules, which adhere to the rock when cold. This test is not very certain, as lead and antimony behave in the same manner and are generally associated with silver, so that the presence of one is a strong indication of the others. Another method is to pulverize a portion of the rock, boil it in a mattrass with nitric acid, and allow it to settle. To a portion of the clear liquor in a test tube an equal portion of a strong solution of common salt is added. If the rock contains silver not in the form of chlorine, a white precipitate is thrown down, which the exposure to the light for a few hours changes to a purple, and in process of time turns black. Other metals, as lead, antimony, and zinc, form a white precipitate, but it does not change its color by exposure to light. If the rock contains copper, a portion of the solution with twice the ammonia added turns a deep blue. By these means the presence of gold, silver, copper, and lead can be determined, which, with tin and quicksilver, constitute the valuable metals on the Pacific slope. The blowpipe, with a delicate pair of scales and the requisite reagent, will determine any known mineral, so that with some little experience any compound of the valuable metals can be easily identified.

After a party in search of placer mines arrives in a district reported to be rich, and where the appearances are favorable, they select a camping ground near some spring or stream of water where their horses can get grass, and proceed to explore the country. Smooth, well-rounded hills and beds of gravel, either near a stream or on the side or top of a hill, are good indications; also quartz veins and boulders. The dirt from the top of the earth is tried by washing in a pan. If it prospects well the discovery is made, but if it shows nothing, or too small an amount to pay, a pit is sunk down until a change is observed in the color or consistency of the gravel, or until the bed rock is reached. On the bars of streams the sand and gravel near the surface are finer and lighter than lower down, and the gold corresponding; the greatest deposit being on and in the bed rock near its surface. In hill diggings, sometimes for the depth of seventy feet, the gold is found equally distributed the whole distance. If gold is found in sufficient quantities, a district is organized and a town springs up. But if after sinking the pits no satisfactory prospect is found, the party move on.

Prospectors often move too soon. When gold is found even in small quantities, the pits ought to be sunk to the bed rock before it is abandoned. Frequently a body of hard clay or cement is taken for the bed rock, not only in prospecting but in working, as at Carpentier's bar in Montana. Some skill is required to select the best place to sink a pit. In most gulches a skilful prospector can select points in which if no gold is found it is almost certain that there is none in it. The best points are where a ridge of rock extends across the channel of the stream and where the gravel is shallow. If a place can be found where the gravel and soil are not more than two feet deep and the bed rock is rough, and on a thorough prospect entirely across the channel no gold is discovered, it is exceedingly probable that none exists in that gulch, or at least near that portion of it. In prospecting for bar claims the most favorable points are where the stream now makes a bend where it formerly ran across. What are called "hill diggings" are beds of gravel deposited by ancient streams when the general level of the country was higher than at present. They are often found under solidified streams of lava, as under Table mountain in California.

Perseverance is a cardinal virtue in a prospector. Many mines are said to be discovered by accident, as in Alder creek, where the prospectors sank a pit, but the prospects appearing too small the party concluded to abandon it except one, who said he would try "one panful of dirt more." The result was the discovery of the richest mines in Montana. At Florence, in Idaho, a man left in camp, while the rest of the party were away prospecting, saw some gravel on the root of a tree in a swamp. Trying a panful, he discovered what is known as the Salmon River mines.

Skill and experience are absolutely essential in this branch of mining. Any mountain not volcanic is liable to contain valuable metalliferous veins. They are found in rough and high mountain cliffs, but apparently not as abundantly as those with smooth outlines. Quartz prospectors follow the foot of a mountain range and examine the sand and gravel in the beds of streams. These beds are generally dry in summer, which renders examination comparatively easy. If the gravel consists of granite, or slate with quartz pebbles, they follow up the stream, breaking open every piece of quartz to see if it contains anything valuable. As they ascend the quartz is more abundant and the pieces become larger until reaching a certain point, where no more is found in the bed of the stream. This shows that the vein is not above but in the sides of the stream, which are now carefully examined.

The vein generally crops to the surface, and is easily found. But when it is covered with soil, trenches are run through it down to the bed rock, at right angles to the supposed course of the vein. This is not done unless the quartz fragments, called "float quartz" are rich in some valuable metal.

Often, though many veins are found in one locality, each sending down large quantities of float quartz, perhaps only one of them has rich float. Here judgment is required to distinguish between the different varieties of float quartz and veins almost exactly alike. The skill of some prospectors is wonderful in determining the existence and locality of small veins covered deep under the soil, whose float quartz is nearly identical with that from a large vein close above it.

In California nearly all the gold-bearing veins are quartz, and the prospectors hardly ever prospect for anything else; but gold is found in paying quantities in slate, as at the Harpending mines, near Fulsom, and the Oro mine, in Bear valley. In Colorado it is found in feldspar, as at the Gregory, Bates, and Bobtail; and in Idaho in porphry, as in the mountains of Silver City.

ON PROVING AND WORKING MINES.

Vein mining for the precious metals will be the principal source from which they will be obtained in the future. The product of placer mines will grow less and finally cease, but the product of vein mining will increase for an indefinite period. If the miners on the Pacific slope could have the benefit of each other's experience, how many millions it would save annually! This not being possible without the aid of a national school of mines, as recommended elsewhere in this report, a few suggestions derived from experience concerning the opening and working of mines may not be inappropriate in view of the undeveloped wealth of Idaho and Montana. Rules of extensive application must be very general in their character, and as the conditions under which each mine is worked necessarily vary, no general rule will exactly apply to every particular case. General rules guard against loss in mining, while particular rules increase the profits. The first quartz mining in California was by Mexicans in 1849–'50. They introduced the arrastra, and by carefully assorting the ores containing fine gold from the surface, obtained by this slow method very satisfactory results. The Americans, seeing these results, put up large mills capable of crushing large quantities, expecting to get profits in the ratio of the amount crushed. Not being properly assorted, much of the rock which they crushed was nearly barren, and their machinery, though very costly, failed to extract the gold which the ore contained. Nearly all these enterprises resulted in a loss to the projectors, and for a number of years quartz-mining was in great disfavor in California. A few miners continued to work and experiment until they were successful, and quartz mining gradually increased in productiveness until it has become one of the most important interests in the State.

The same changes were observed in the silver-bearing veins in Nevada. First, a season of discovery and excitement, followed by wild speculation and extravagant expenditure; next a time of disappointment and distrust, and this by a general season of prosperity and profit to all well-conducted enterprises. The same changes are taking place in Colorado, Montana, and Idaho, with scarcely any variations, except such as are induced by local causes. It is desirable to know the causes that act injuriously in one locality, so that they can be avoided in another. The conditions under which mines are worked are nearly similar on the whole Pacific slope, and a mode of working that is very defective in one locality must be objectionable in all others which it resembles, and a mode of working that experience has proved to be best in a given district with slight modifications, will be adapted to other districts containing similar conditions. These principles underlie all business transactions, and cannot be violated with impunity. One of the fundamental errors in mining is to make a false estimate of the value of the mine, the amount and richness of the ores, and the cost of extracting them. The richest mining districts contain many veins that will not pay to work, and great care is required to know whether a vein will pay for working or not. Locality is very important: if a vein be situated in a large mining community where labor and materials are cheap and abundant, the cost of working will be greatly less than in new and unsettled districts, where the pioneers must take all supplies with them, or where freights are high or wood and water very scarce as in a sterile region. In old and extensive mining districts the cost of opening a new mine, extracting the ore and reducing it, can be quite accurately determined, and its value known by such extensive workings as admit of no serious mistake, especially when it is known what varieties of ore can be profitably reduced by the method of reduction practiced in the district. In new districts, unless freights are very low, mines of gold and silver only will pay to work, and they must be so rich and large that there is no question of the quantity and quality of their ores. If a vein produces rich ore, the next point to ascertain is its size, and what quantity of ore it will yield. First, thickness; if a vein is not four or more inches in thickness its value is very doubtful, unless remarkably rich. Very rarely a vein is discovered like the Oro, in Bear valley, Mariposa county, California, which was not more than two inches thick, but paid wonderfully for a short time, and then gave out. No confidence can be placed in the extent of such small veins, for the extent of the vein is usually in the ratio of its thickness. In working a vein the miner must make an opening three feet wide to allow room for working, and this space must be excavated whether it contains ore or not. Veins are nearly always softer than their walls, and can be excavated for much less cost than the same amount of wall rock. In the three feet vein nothing but ore is taken out, but in a four-inch vein only one-ninth is ore, and in the most favorable circumstances the ore from the small veins costs nine times as much for mining as the larger, and owing to the hardness of the wall rock, it may be 20 times more. A two-feet vein sometimes requires heavy timbering, but may be worked nearly as cheap as a three-feet one, for the worthless rock that must be broken can be used to secure the mine instead of timber. This is done in larger veins, as all contain barren portions which are used to support the mine, and nothing requires more skill in mining than to leave the barren portion, and excavate that which will pay. The shafts and drifts in a small vein must be the same as in a large one, and the pumps and hoisting machine nearly or quite as costly. It is a general rule that the larger the vein, other things being equal, the less the cost per ton for extracting the ore. For instance, Quail Hill No. 1 mine, in Calaveras county, California. Here the workmen offered, after the mine was opened, to deliver the ore at the mouth of the vein for 50 cents per ton. This vein is from 70 to 80 feet thick, and well opened. The thickness of a vein cannot be known until it has been opened to a considerable depth, and traced on the surface for the length of the claim, or as far as it can be followed. Tracing on the surface is more cheaply done than sinking, and more likely to intersect any "chimneys" of ore that may exist in the veins. Extent at the surface is commonly in ratio of depth. Where veins come to an end they usually split into a number of small seams, which disappear as they are followed, but when only one seam is found the vein generally continues. It is important to know the character of the vein, whether it is regular or irregular in size and richness, whether it is full of "horns" or afflicted with "faults." Generally the greater portion of the ore is found in what are called "chimneys" or "chutes," as in the Comstock, which is rich for some hundreds of feet in length, and then for as great or greater distance is barren. Chimneys seldom descend at right angles to the strike of the vein, but dip lengthwise in it, and sometimes leave one claim and extend into another. In estimating the amount of vein stuff in a vein, it is safe to allow 14 cubic feet to the ton, as it is found in the vein; this is more than the formula in the books allows, but it works well in practice. Thus, if a vein is traced 1,000 feet, and shows an average thickness of one foot, 1,000 feet deep will give 70,000 tons of vein stuff. Few veins of this size pay to follow so deep, and one-half of this vein stuff, or 35,000 tons, is all that can be relied on. These calculations in veins that are opened are of great value in estimating the available ore on hand, but in unopened mines they only give a vague idea of what might be in them under the most favorable circumstances. In former times, 2,000 feet was about the working depth of the best mines; but in the future, owing to improved methods of working, the same class of mines will be worked to a greater depth. Some veins get thicker as they are followed down; others get thinner, and finally disappear. Generally they are more liable to decrease than to increase in value. The improvements of the present time in mining machinery render the working of a mine much more rapid than formerly, and as much ore can be taken from a mine in 20 years as in 300 when the ore was carried on the backs of men up rude ladders out of the mine. By this rapid method mines can be worked at much less cost than when the work is done very slowly; thus a mine that contains 400,000 tons of ore at 100 tons per day will be exhausted in about 15 years, but at 8 or 10 tons per day it will require 150 years, and the cost of keeping the water out and repairing the timbering in the shafts and drifts would give a good profit on any moderate-sized mining enterprise. Neither could

the ancient miners extract such vast masses of ore as are taken out of the Comstock, without leaving a large portion in the shape of pillars to support the walls. Probably no mine was ever worked under the same difficulties so rapidly and efficiently as the Comstock. The great loss has been in the treatment of the ores. If a vein is in a favorable locality for working, has ore of sufficient richness to pay when worked in quantity, has the proper thickness, and is traced on the surface the requisite distance, is opened in depth so as to show a body of ore, and has the same strike, dip, and general appearance of other good veins in that immediate vicinity, and is in range of a good mine, there can be little doubt of its value.

GOLD AND SILVER.

Eastern Nevada.

[From our Regular Correspondent.]

WHITE PINE DISTRICT, June 5, 1868.

In the fall of 1865 the White Pine mines were discovered, and the district organized, its centre being somewhat about 120 miles east of Austin, in the third range from the Toiyabe mountains. The lodes first located were on the western slope of a high mountain chain, in a formation of granite and slate. Subsequent explorations proved that there were mines on the eastern side of the range also, in a limestone formation. The hills on which these were discovered are not of equal height with the main range, but they are probably from 7,000 to 8,000 feet above ocean level. The lodes in the granite are well defined, and from four to ten feet in width, but the ore is what we consider of low grade —giving a pulp assay of from $80 to $120 per ton. Those in the limestone, first discovered, contain a large percentage of lead and copper, but carry quite as much silver as the others. Last fall an Indian brought a piece of very rich silver ore to a miner living at the original White Pine camp, and on being asked to show where he found it, he conducted his pale faced friend to the summit of a mountain lying to the east of the base-metal mines already alluded to. Here the lodes now known as the Hidden Treasure, Aurora and others were found and located. A new mining precinct was organized under the name of Pleasant Valley, but as it was ascertained to be within the bounds of the old White Pine district, the new organization was disregarded. The ore of the new mines is remarkable for its richness, as also the purity of its silver, and a larger quantity of rich surface ore is available than has ever been previously discovered in any part of this State, or, indeed, probably in any other country in the world.

TREASURE HILL.

This is the appropriate name which has been given to the mountain, on the summit and flanks of which the principal mines have been found. It is of an oblong shape, its apex being, as I suppose, nearly 8,000 feet above the sea; yet it is only a hill compared to the grand old White Pine range, which runs along its western side a few miles distant. Near its summit it has a kind of table land sloping off gently towards the west and northwest. Its southeastern face is steep and rugged, with great massive reefs of rock projecting, so as to give it a terraced appearance, the inclination of the stratas being about ten degrees towards the northwest. The formation is a compact dark grey colored limestone, of crystalline fracture, almost similar to that of some of our other mining districts, only it appears to be nearly free from the breaks and slides so common in them, greatly to the mortification of the miner. At various points in the district well preserved fossils, belonging, I think, to the Lower Silurian age, are plentiful, some of them being found imbedded in a dark colored quartzite usually running parallel with the lodes.

LODE OUT-CROPS.

There is more spar capping and running along side of the paying portions of the lodes than I have seen in any other district. There is one immense ledge of white and pink colored spar running along the eastern slope of Treasure Hill, and traceable almost due north and south for several miles. At some points it is from 150 to 200 feet wide, but there are only two places found as yet along its course which yield silver ore. These are on its eastern side, where it is cased by a hard, black quartzite, with a belt about 200 feet wide of light brown colored clay slate, lying immediately east of the latter and running parallel with it. The veins of ore alluded to are from ten to twelve feet wide, and when they are sunk upon I have no doubt it will be admitted that one really great lode, deserving of being ranked with the Comstock, has at last been discovered. Most of the other lodes in the district are also capped with spar, but they seem to be irregular in their courses, and to have detached deposits of ore, and cross veins, which make the lode system of the district a puzzle to most new comers. There are locations made by the miners as if the ledges ran towards all the different points of the compass, and some of those which are believed to be of great value are not traceable in any direction beyond the outlines of the prospect hole, in the digging of which the discovery of ore was made. This, in some cases, is owing to detrital matter having covered over the croppings, but in others it is due to the irregularity of the ledges already referred to.

QUALITY OF ORE.

The quartz of Treasure Hill has a very singular appearance to those whose knowledge is confined to the Virginia, Austin, Twin River or Silver Bend ores. A good deal of it is of a blackish brown color, with a compact but not flinty texture, and even though it shows no silver to the eye, it assays from $30 up to $100 per ton. When streaks and specks of chloride of silver are visible in this kind of rock, it assays very high. The richest ore in the district is a metallic and yellow chloride. From some of the mines now being worked upon, I could easily select several hundred pounds which would yield ten thousand dollars per ton. The surface quartz of some of the second rate claims is a cindery decomposed mass, in which an occasional piece of good ore is found. Probably when depth is attained the quartz may become solid, though in most cases I fear such cindery deposits are not very reliable.

THE CLIMATE

of White Pine is anything but pleasant, at least at this season of the year. Scarcely a day passes without the mountain tops being enshrouded in snow and hail storms, even in this, the month of June. On the flanks of the mountains snow-banks, 30 feet high, are numerous yet, and the miners are frequently at work high up amongst the clouds, when the cheerful valleys far below are bathed in sunshine all the day. But if the mines prove as good as men of large experience anticipate, such a disadvantage as this will not be thought anything of.

WOOD IS ABUNDANT

on all the hills around the main mining belt. The balsam, (*Pinus balsamifera*), or what is known in some parts of the country as fir, is here erroneously named white pine. It is found in masses towards the summits of the highest mountains, and is sufficient to furnish all the mining and milling timber likely to be required in the district for years to come. Extensive groves of mountain mahogany (probably the heaviest and best heat producing wood on the continent) are numerous and convenient to the mines. Sufficient water for milling operations is obtained from a number of springs not over two to three miles distant. With these advantages, and large quantities of ore easily amalgamated without roasting, there is no reason why milling should cost a company, building their own mill, over $25 per ton. When depth is attained on the mines, the ores may perhaps become refractory, and then no doubt the use of fire will be indispensable to reduce the sulphurets, but mills might be so constructed as to work either wet or dry, according to the nature of the ore to be operated upon.

A GREAT MINE.

I think I am safe in hazarding the assertion, that the largest and the richest body of ore ever dug out of a silver mine within four feet of the surface, is now being exposed in the South Eberhardt mine of this district. The lode appears to be at least twenty feet wide at the point where the rich ore is found, and an open cut four to five feet deep is being carried along its course from wall to wall. The ore being extracted has very little quartz in it, being a mass of horn silver, stetefeldtite, and yellow chlorides, and so heavy is it, from the amount of silver it contains, that many pieces handle as if they were crude bullion. Slabs of the wondrous metal are daily being quarried out by pick and gad, which are so heavy that the strongest miner in the camp cannot lift one end of them off the ground, and yet they are only small chunks after all. Two men dig out about a ton each of the mineral per day, and I am convinced it will not yield less in the mill than $1,200 in bullion to the ton. Were it not that I detest anything like exaggeration in connection with such matters, I should put its value a great deal higher. In due time I hope to be able to report in the *Journal* its actual yield. The ore taken out after a few days' work of two men is worth at least $10,000 in coin, and there is already enough more in sight within four feet of the surface to yield $50,000. When the Ophir mine, on the Comstock lode, was first worked, it yielded some fifty tons of very high grade ore, the value of which was mainly due to the large amount of free gold present. The Eberhardt will go far beyond the Ophir in the quantity and quality of its surface rock, and it contains no other metal than silver, which readily boils out in countless globules if a piece of it is thrown into the forge fire. A parallel ledge, or what is more probably a branch of the main Eberhardt lode, is being worked by other parties under the name of the Keystone company, and is yielding an equally high grade of ore, though its width is not more than one fourth of that of the Eberhardt. The latter is owned by four hard working honest miners, all of whom have seen the ups and downs of a prospecting life. One of the four acquired his fourth interest only two months ago, for the paltry consideration of $25, and now he would refuse $25,000 in gold for the same ground were the offer made to him. The truth is, the owners can take out a $100,000 and still have their lode not opened for more than one eighth of its length, or beyond the depth of ten feet from the grass roots. This and kindred discoveries in the district will, after a time, convince the unbelievers in silver mines, who perhaps may have been scratched by wild cats, that mining for silver, provided it is gone into with judgment and skill, is not such a bad business after all.

OTHER GOOD MINES.

The Hidden Treasure, Aurora, Genesee, Iceberg, Virginia and Midas are all very promising mines. The deepest work on any of them is not over fifteen feet, but they all show large quantities of fine surface ore. How these and the other lodes of the district will behave under development is, as a matter of course, unknown, but where there is so much top-ore, the natural inference is that there are large deposits of the same kind below. There will be some vigorous mining done in the region, and before two years I believe there will be very heavy shipments of bullion from White Pine district.

MAMMOTH DISTRICT.

I have reliable information of a valuable discovery having been made in the Mammoth range, about seventy miles southwest of Austin. A large lode, named the Marble Falls, was located on the 25th of April, several miles west of the old Mammoth silver belt. The pay streak is ten feet wide, and is rich in gold as well as silver—the yield by a working test being over $300 per ton, though it was supposed considerable gold was lost in chloridizing the silver. From various chimneys along the lode several hundred dollars to the ton in gold have been obtained by amalgamation, the silver in raw working not being saved. It is estimated by competent parties that there are 2,000 tons of surface ore available, which will pay $150 to $220 per ton. The mines of Mammoth district, discovered in 1863, have always been considered valuable, though the ores generally were too low in grade to be profitably worked at the present cost of mining and milling. The Mount Vernon company of New York has spent a large amount of money in prospecting a series of mines purchased some years ago. I learn that one of the lodes has opened quite satisfactorily, but the funds of the company seem to have become exhausted, and work was stopped some months ago without payment being made of the miners' wages. This new discovery will probably revive the confidence of claim owners, and may lead to further developments.

THE CENTENARY COMPANY'S

mill at Newark is now steadily at work on ore from the Chihuahua mine. I understand that the pulp assays of the daily workings are from $115 to $120 per ton. A shipment of bullion of the value of $10,000 was made from the mill a few days ago, and for some time to come there will be considerable consignments of a like nature. Recent developments on the Buckeye lode of the company are very encouraging. A fine body of surface ore, worth $200 per ton when assorted, is being mined, and as work progresses the milling rock seems to increase in quantity without the quartz getting worse.

E. J. DARE.

NEWS FROM PAHRANAGAT—ITS MINES, MILLS AND FURNACES, AND SOMETHING ABOUT THE "STEVENS' FLUX."

We are permitted to make the following extracts from a private letter, bearing date June 2, from Hiko, Pahranagat district, Nevada. The writer criticizes very severely the present system of mining in that district, and offers incidentally some wholesome suggestions for its improvement. His closing remarks on "a new smelter from Chicago," are very interesting at this time:

* * * * I have just returned from a prospecting tour. In February last we departed for Robinson mining district, 160 miles north of Hiko, and 50 miles south of Egan canyon. Arriving at that place, I found it still covered with heavy masses of snow, above which could be seen, at some points, croppings of veins of enormous size, composed of genuine quartz. But my fire assays and close examination, when the snow was gone, dispersed the pleasant thoughts of a fortune made, and I returned to Pahranagat, arriving about the middle of May at Hiko, after an absence of about three months. *En route* I saw from a distance Ostrom's twenty-stamp mill, but, alas, it was not running. In vain I looked for smoke from its tall chimneys; in vain I tried to catch the sound of an industrious battery. The good mill was idle. It ceased to work, as I learned, after about one month's run. Ostrom I did not find. He was gone to Austin with 500 or 600 lbs. of bullion. I was not able to ascertain the exact quantity, nor the quality of the bullion, in spite of repeated inquiries. Some say that the money value of the product of one month's run was about $10,000. A queer mystery envelopes their operations. I asked what was the cause of closing the mill. The bricks did not stand, was the answer. But I fear this is not the real truth. Some of the furnaces are still so good as not to impede the running of the mill. Great want of quartz, of *pay-rock*, is the undeniable reason, as I know from a look at the mines. The mill is too far distant, and yet they talk of erecting another one of twenty stamps. It is to be regretted that, in the face of a long and bitter experience, work is still pursuing its old course in this camp. At the Illinois and Indiana they have together a force of about twenty-eight men. They are searching for quartz, without a proper system. Here I cannot help asking you a question. Is it not the duty of an honest man, witnessing a foolish, miserable and squandering system of work, to call the attention of interested parties at a distance to such proceedings, that they may be examined into and stopped? * * * * The affairs of the List lode company are badly managed, and their indebtedness must be great. It is difficult for the Superintendent to keep in board the few hands working around the mill. The lode is opened now to a depth of 135 feet; the work is done by contract, and is all concentrated on a shaft, following the dip of the lode. Three shifts are working. The lode shows no ore at the above level, and very little quartz. At Hiko they tried to work rock of the Juniper and San Juan lodes, when the mill was going. They were not successful with this class of ore. * * Sherwood and Springer are also doing some work on their mines. Pahranagat is still a place of alternate excitement and inactivity, and of foolish enterprises. They are building mills before they have mines, and now they are about to commence smelting again. A new smelter from Chicago has arrived in camp. The proprietor works the ore up to 95 per cent. of the fire assay, and at a cost of fifteen dollars per ton. He only extracts the silver from the ores; all the base metals he brings in the slag. It makes no difference how quartzose the ore is. With equal ease he smelts quartz, galena, copper ores, zinc blende, lime rock; also *horn, blende*, which *he* found in our district, and declares to be the *very same hornblende* he had seen in Mexico! You are undoubtedly aware that Pahranagat has no hornblende. Of course he wouldn't tell his way nor his flux. The latter is his own important secret. He takes out a patent now, and it only costs $25,000 to get possession of the secret, when he has secured the patent. He made a run of Nevada ore—they say 200 lbs—rich ore, showing little quartz, and obtained a quantity of matt and some metal, altogether 18 lbs. Carbonate of soda, and the residue of the manufactury of soda from cryolite (at Natrona, Pa.), are the constituents of his flux. Cryolite is a double compound—fluoride of aluminium and fluoride of sodium. It is necessary for the manufacture of the metal aluminium, and is now also used to make carbonate of soda. No concentrating of ore by mechanical operation is required in his way of working. He has the quartz killing powder, and cheap too! Sensible men believe him.

California.

THE NORTH STAR MINE—LETTER FROM PROF. SILLIMAN.

NEW HAVEN, June 17, 1868.

EDITOR AMERICAN JOURNAL OF MINING:

You will find enclosed a proof sheet of an article prepared for a local paper in Grass Valley, Cal., giving a description of the present condition of the "North Star" gold mine. This mine I am particularly familiar with, and know that it ranks with three or four others at the head of the list of dividend paying gold mines in California. In Grass Valley it is second in value only to the Eureka, and is esteemed by some as the better mine of the two. The point of interest for your readers in its history and present condition is, that it is a thoroughly well developed mine, with a very great extent of ground open, and years of reserves now standing in advance of all demand for milling. Not less than 75,000 tons of such reserves are now under actual measurement. The tenor in gold of its ores may be fairly stated at $50 per ton. Often the ores reach $80 or $100 per ton, but again they may not exceed $25 per ton. The present yield of sulphurets is large, not less, it is said, than six per cent. of the ore, which is double certainly the average yield. These sulphurets are worth from $80 to $150 per ton of concentration, containing about 90 per cent. of sulphurets to 10 per cent. sands.

With five or six levels and sets of "backs" open, they are constantly sinking to lower levels. There are three working shafts upon the mine. The main incline is about 900 feet deep. They are now contemplating sinking yet a fourth shaft to explore a large mass of valuable ground to the east. They have lately added to the ownership a highly important body of ground on the west side of the main incline (known as the "*Edmonton* ground") giving them a body of reserved ores quite equal, probably, in amount to those already named, but not included in that estimate.

The lesson taught by such management as has been shown in the North Star and the Eureka mines of Grass Valley is of the highest value to the mining interests of the whole country. It is true that the only regularly dividend-paying gold mines in California are those in which the system of extensive exploration in advance of reduction of ores has been boldly and steadily followed, and if the same system of good management could be introduced into our other mines in Nevada and Colorado, not to forget those on the Atlantic coast, we should be relieved of the opprobrium which now so generally attaches to the business of mining. The milling power of the North Star mine has been steadily augmented, as from time to time the developments of the mine have demanded. Thus for a long time in its early history they used only six stamps, then nine; in 1865 the mill was enlarged to sixteen stamps, crushing ten tons each. There are now twenty-four stamps, and ores enough at command to run another custom mill outside their own premises. Contrast this with the history of so many Eastern enterprises which have been based on a mill of twenty or thirty stamps before any mine whatever was developed!

Neither should it be forgotten that in these successful enterprises they do not hesitate to spend money for new and important improvements. The new engines, boilers, mills and dressing works at the North Star mine have demanded large sums of money. The new hoisting works and shafts at the Eureka last year cost about one hundred thousand dollars, which was paid from earnings and beyond regular dividends.

By a similar wise policy the "Amador mine" (Hayward's) has reached its present prosperity, with not less than five years of reserves in sight with regular monthly dividends of $22,000, and occasionally one of $44,000. On the other hand, the famous "Allison's Ranch" mine, of Grass Valley, which has paid in profits over $2,300,0000, was brought to the verge of ruin by the opposite and suicidal policy of "picking the eyes out of the mine," and is now idle and some of its owners bankrupt as a consequence. If mine owners will avail themselves of the practical teachings of these examples, our list of dividend-paying mines will be larger.

B. SILLIMAN.

The following is the article referred to by Prof. Silliman in the opening sentence of his letter. It was originally published in the *Grass Valley National*, and is a very full statement of the present condition of the North Star mine. It is especially valuable to readers of the JOURNAL OF MINING as suggesting the way a mine should be managed in order to be a success:

"It is an old saying, 'if you want a good mine *go down*,' and in this instance it has proved true to the letter. We visited this celebrated mine yesterday, and were courteously shown around, both above and below, by Thomas Eudy, one of the foremen of the mine. We were much pleased to see things looking so well, and particularly so to see the mine with its veins teeming with rich sulphurets and free gold. The company have now in use four batteries of four stamps each, and are having two more batteries of four stamps each put up, which will be working within

thirty days. They are also putting in another boiler, of great power, making three in all, which will give them all the steam power required for the development of one of the best mines in the State, for such we believe it to be, and time will prove that we are right in our statements. The mine is now being systematically and energetically worked for its development, and is probably as thoroughly tested by shafts and galleries as any we have in the State, not even excepting the celebrated Amador mine in Amador county, and the fact is fully established that we have in Grass Valley a reliable mining locality, although there are hundreds of claims within a radius of two miles, of a similar character, and embraced in same formations, that are lying comparatively idle for the want of money, energy and skill, to thoroughly test and develop them. This mine has been explored by an incline shaft running north, at right angles with the strike of the vein, for 900 feet, opening up immense bodies of ore from which a six stamp mill was supplied from 1856 to 1859; nine stamps from 1859 to 1865, and sixteen stamps from that to the present time, also supplying a twenty stamp custom mill for three months past, and leaving as reserves in the mine more than a two years' supply for a much larger mill. During this time several million dollars have been added to the circulating medium in this place, and yet but a small portion of this valuable mine has been exhausted east of the incline shaft—while the whole western portion, for 1,300 feet, is entirely virgin—having been merely tested by drifts to prove its value. This portion of the ground, known as the Edmonton claims, was recently purchased by the North Star company from Watt, Scadden, and the Coleman brothers. A noticeable feature in this property, one that adds materially to the prospective value of other mines in the district, in similar formations, is that of the gradual increase of not only the size of the vein as depth is attained, but a gradual improvement in the value of the ores per ton at the present depth of 900 feet. At this depth the ground is found much easier to work than it was nearer the surface, while the ore has more than doubled in richness. The company very wisely are still *going down* for another level, and they say they never intend stopping until they are driven out by heat or reach China. 'Good wine needs no bush,' neither does a good mine need praising, for it speaks for itself, but we must acknowledge that we saw such sights and slathers of the yellow dross that it caused us to be a little envious of the good luck now attending the owners in this rich mine. We went all through the mine and were greatly astonished to see the vast quantities or ore laying around and ready to be hoisted to the surface. Most of the work is done by contract, which is the proper way to work a mine succesfully, and our quartz men are finding it out. The mine looks well and the company are taking out from forty to eighy tons of rock per day. In the sixth level, east, the ledge has been drifted upon for about 300 feet, and it is from two to three feet thick. We have seen ore before, but nothing to compare in beauty and richness, both in gold and sulphurets, to that we saw in this level. In the fifth level, east, the ledge will average two feet in thickness through all the "stopes," which are 300 feet long, and the lengths of the drifts about 600 feet. In the fourth level, east, the ledge also shows well, with great abundance of ore, in sufficient quantities to last for years. In the third level the ledge will average two feet in thickness, with plenty of ore in sight held as a reserve for the future, when a new shaft, in contemplation, shall have been put down to work this portion of the company's ground. The ledge in the second level shows very well, is about eighteen inches thick. The distance to the surface is 450 feet, all of which is good ground, comparatively untouched, and there is over *two* years' work in "backs," on the *east* side, saying nothing of the *west*, which is virgin, the company have just commenced "stoping." There is all of *ten* years work in sight. A short distance from the company's main works is the Glassen shaft, owned by them, but leased to a company of miners on half shares. The shaft is down about 110 feet and a good ledge has been found, the rock paying from $60 to $80 per ton. The company have about 350 feet of "backs" from bottom of shaft. The rock is very rich and we could see gold in a number of pieces picked up from the dump-pile. The North Star boys are continually making improvements to better facilitate the working of their valuable mine. Besides putting in more stamps, another boiler, etc., they contemplate putting up chlorination works to work the sulphurets. At present the sulphurets are being worked at the Eureka sulphuret works. The company have in use eight of Hendy's concentrators or pans for saving sulphurets, two of which are used for reconcentrating sulphurets worked through the six pans. After passing through the latter concentrators the sulphurets contain only about ten per cent. of sand. The sulphurets will average from $80 to $150 per ton. Most all the work under ground is let under contract, consequently the miners are equally interested with the owners of the mine in its successful development. The mine has yielded about $10,000 in rich specimen rock within ten days past, and there is a great deal more of the same kind to be seen in the ore from the fifth and sixth levels east and west. In the bottom of the shaft the ledge is three feet thick, showing sulphurets and gold in abundance. The company will start drifting on the seventh level on Monday, when our readers will hear of quantities of gold being taken out, as the deeper the mine is worked the richer it has proven in the past, and it is a fair criterion to judge for the future. The North Star is a valuable mine, although, comparatively speaking, it has been but scratched over, and the owners have ten or twelve years work in sight if the mine is never explored a foot deeper. The vast amount of gold yet to be taken out will astonish the world, if not the owners of the mine, who have a fair conception of the value of their property."

[From an Occasional Correspondent.]

Georgia.

THE STEVENS FLUX AND THE NATIONAL DEBT, GOLD MINING.

CUMMING, Forsyth Co., Geo., June 16, 1868.

EDITOR AMERICAN JOURNAL OF MINING:

It may be interesting to your readers to learn that some parties interested in the "Stevens Flux" are busily engaged in building a furnace at Acworth in this State. We are promised remarkable results, and no doubt the papers will soon herald them forth in remarkable style. Indeed, if the predictions made here are fulfilled, gold will soon be so abundant as to be comparatively worthless, and the gold mining interest, instead of being benefitted by the flux, will be totally wiped out. The workers of the so-called Old Franklin mine, in this neighborhood, are getting at present very fine ore, worth from $20 to $30 per ton. They have a fine twelve-stamp mill ready, and will commence to run their ores through it next week. I am still sinking on my veins, and intend to go at least 130 feet down. I strike continually new veins, varying in width from four to twelve feet. The ores carry free gold and a large amount of sulphurets. The mine is remarkable on account of its immense masses of ore, and from the fact that there is hardly any barren rock in it. I can raise, with but little cost, 100 tons of ore daily. Two hands can take out from eight to ten tons per day. I am now 80 feet down, and have tunnels at several depths from the shaft, to cut the veins again, which improve continually as I go down on them. I will not put up machinery until next fall; in the meanwhile, if the "Stephens Flux" people should happen to take hold of my ores, you may expect to hear that the United States debt has been paid, and that the Secretary of the Treasury has bought Mexico and the whole of South America.

DR. S. F. CHARLES.

[FROM AN OCCASIONAL CORRESPONDENT.]

Canada.

THE SILVER-BEARING REGION OF LAKE SUPERIOR—ITS MINES AND ITS PLEASURES.

TORONTO, Ont., June 23, 1868.

EDITOR AMERICAN JOURNAL OF MINING:

Thinking that a short description of the silver-bearing region of Lake Superior, and the route to it, might be interesting to your readers, I beg leave to occupy a portion of the JOURNAL OF MINING with an account of my trip to that locality this spring. We left Toronto on the morning of the 12th of May, by sail, for Collingwood (90 miles). We there took the steamer Algoma direct for Fort William, on Thunder Bay, passing in our route the Indian villages of Killarney, and Little Current, the Great Manitoulin Island, Bruce Mines and Saulte Ste. Marie. We had on board quite a number of passengers, all of whom were more or less interested in mineral lands. Amongst whom I may mention a Mr. McDonald, imported by the Thunder Bay Mining company from the silver mines of Norway, and Hartz mountains of Germany, to superintend their mining operations. The steamer was loaded with lumber, machinery, provisions, &c., for that company, and they intend pushing on their work as fast as possible, and so well satisfied are they with their prospects that they have cleared the ground, and are now erecting their stamp mills, and building houses for their men, etc. They have a very good dock built since they got there this spring, at which the steamer landed on her last trip, to put off their machinery, which was contracted for in England last fall and winter, and brought out this spring in time for the first boat. It will be put up and ready for work this fall. So you see they are in earnest. I have been told that their capital stock (£500,000 sterling) was taken in three or four days time. Their miners have been at work all the past winter; and I was shown a piece of quartz rock, taken from their vein, at a depth of six feet from the surface, weighing about 200 lbs., that contains fully 50 per cent. of native or metalic silver. It is now in the possession of Mr. McIntyre, at Fort William, who takes great pleasure in showing it to all who desire to see it. I have been thus particular in my description of the Thunder Bay company's doings, to show you that others, besides ourselves, have confidence in the value of these mines, to invest large sums of money in them. We have had miners at work on our lands since the 15th of July, last year. We have sunk a shaft 7×10 feet, 67 feet deep, and have found silver, in various forms, all the way down. The rock is the same as the specimens I sent Messrs. Adelberg & Raymond, of New York, last winter; but there is a decided improvement in richness. We have taken some fine specimens of the black sulphurets of silver, with the quartz rock also. At a distance of about 300 feet from the above mentioned shaft, we have sunk another 33 feet, and find the same character of rock. We have uncovered the vein between the shafts, and have found metalic silver on the surface, nearly the whole distance. We have also made cross-cuts on the vein, both east and west of the shafts, the distance of 1½ miles, and have found the vein carrying a uniform width of from 16 to 22 feet. One vein was examined by Prof. Rudolph, of Ontonagon, Mich., last summer, and he pronounced it to be the champion lode of the country, and a *true* silver bearing lode.

As yet, there are no hotel accommodations, either at the mines or at Fort William; but if any of your readers would like to make a visit to that shore, we can make them quite comfortable. A visitor cannot get away in less than ten days, but we think he can spend that length of time very pleasantly. We have only one boat on the route as yet, and it takes her ten days to make the round trip. The iron steamer Chicora will go on the route as soon as her repairs are completed, which will be about the middle of August; this will give us a boat every five days.

A fisherman, or, as A. Ward would say, "a fishist," can find all the sport he can attend to, with speckled or brook trout, which, in every respect, cannot be surpassed by those of any country in the world. I have heard of their being caught, weighing from eight to ten lbs., but I have never caught them weighing over four lbs. I found very great sport in trolling for the salmon trout, one of the finest fish they have, and second only to the salt water salmon. Myself and two others caught seventeen, from 2 until 6 o'clock, one afternoon; the united weight of which was 125 lbs. * * * * The cost of the round trip from Toronto to Fort William and back (meals and staterooms included) is thirty dollars, Canada funds, or gold. The visitor will not find such heat and dirt as of New York, to contend with, but he may find the black fly very troublesome. One, however, soon gets accustomed to them, and they are not troublesome after 5 o'clock. Heavy clothes are very comfortable at night.

I send you a copy of the Toronto *Globe*, from which you will see that the Canadian Government have decided that our lands are not subject to Royalty, having been patented to us without any reservation; so that we possess advantages over all parties taking up lands since the 1st of July, 1867, or who may have held patents previous to July, 1866; as all lands patented previous to '66, and since July, '67, are, according to the gold and silver mining act of 1868, subject to a Royalty of from two to ten per cent. on the gross product of the mine. J. E. W.

COPPER.

Michigan.

We learn from the Portage Lake *Gazette*, of June 25, that the product of the National mine, for the month of May, was forty tons nineteen hundred and seventy-two pounds. The product of the Calumet, for the month of June, to Wednesday the 25th, was nearly ninety-six tons. The water in the reservoir is rising very slowly. At the Delaware the east vein continues productive and will soon be cut by a cross-cut at the fifty fathom level, which will prove it in depth. At the Amygdaloid they have cut a vein to the east of their present workings, drifting was commenced upon it and developed a fair stamp vein carrying some heavy copper. At the Phœnix they are, to some extent, using Dynamid in the Ash-bed, which is looking remarkably well. At the Calumet both heads of Ball's stamps are running steadily, as if no interruption from the breaking away of the dam had occurred. The yield from the mill is fully up to the best average of the past. In the midst of large production, considerable attention is given to the erection of shaft-houses, and other improvements necessary to the full equipment of the mine. We understand the product is fully meeting all expenses, besides very materially reducing the debt. At the Quincy a very important discovery was made at the 140 fathom level, where, by cross-cutting west some ninety feet, the main part of the lode is found to exist quite wide and rich. It seems at the 100 a branch was followed as the vein proper, which yielded a diminished amount of mineral, giving the impression that the lode, owing to the depth, was becoming exhausted.

IRON.

New York.

A correspondent writes in the *Times* some interesting facts relative to the strike at the Iron works in Troy: It appears that a number of men employed at the rolling mills owned by H. Burden & Sons, Erastus Corning & Co., and John A. Gilswold & Co., is about seventeen hundred; the weekly earnings $25,000; value of one week's productions, $105,000; consumption of coal per week, 1,700 tons; weight of pig iron used per week, 1,200 tons. The strike is now in the third or fourth week of its career, the puddlers and their helpers being the parties chiefly concerned, although some of the rollers and heaters are believed to sympathize with them. The puddlers earn about $20 weekly, (five days's work), and the helpers make about $11 in the same time, including lighting up. The cost in wages of making one ton of bar iron from the pig is $22. The advance asked by the strikers would increase the cost about $2. This, the proprietors of the mills affirm, will take away all the profit they are making on bar iron; for this reason they had rather close their mills than agree to the strikers' terms. The men are acting peaceably, a considerable number of them having gone as laborers to build the railroads now being constructed from Chatham Four Corners to Bennington, and from Glens Falls to Fort Edward, although they are in receipt of less wages than if working at the mills. They expect by this to force the mill owners to accede to their terms, and at the same time earn enough to keep themselves and families until the lighting up of the mills.

Personal.

COL. BUEL, of Nevada, we are informed, has sold his interest in the celebrated High Bridge Mine, for £200,000 (or about $1,000,000) to some English capitalists, and has purchased a hotel in London. The Colonel evidently thinks that the next best thing to a good mine is a first class hotel. It takes a smart man to run either, successfully.

Mr. C. H. FERNALD, principal of the Houlton Academy, is to be engaged during the summer in making geological examinations, his services having been secured by Prof. Hall, formerly State geologist of New York. Mr. Fernal intends soon to visit Portage Lake, to examine specimens of fossiliferous deposits.

PROF. C. F. CHANDLER, the able professor of chemistry at the School of Mines, of Columbia College, has received the appointment of chemist to the Board of Health, of this city. A better choice could not have been made.

PROFESSOR JAMES C. WATSON, the young but already celebrated astronomer, of Michigan University, has just published, through Lippencott, of Philadelphia, and Trubner, of London, a large and costly treatise on astronomy.

GOODYEAR BRO'S & DURAND, the prominent Broad street Bankers, failed last week. They held several thousand shares of Combination S. M. Co. Stock, which accounts for its low price in the market at this time.

A. PARDEE, Esq., has been appointed resident director of the Hazleton Division of the Lehigh Valley Railroad. He has the control and general management of all the business of the company on this Division.

Mr. J. I. Ilsley has, we understand, been appointed superintendent of the Lehigh Coal and Navigation Company, *vice* Mr. Leisenring, resigned.

JAMES OSTROM, Superintendent of the Pahranagot Valley Silver Mining Company, of Nevada, has just returned to this city from the mines.

Mr. J. B. WOLF, of Colorado, is in town on business connected with the welfare of that territory and Dakota.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men, and Others.

78,878, antedated February 10, 1868.—DISTILLING PETROLEUM.—Arthur Kirk, Allegheny City, Pa.

I claim, 1. Effecting a continuous distillation of petroleum, or other distillable substances, by causing it or them to flow through a succession of stills, giving off in each still the more volatile ingredients, the stills being connected by trap-pipes *x y z*, &c., so as to prevent the backward flow of the substance to be distilled, substantially as above set forth.

2. A nest or battery of stills, for purposes of distillation, two or more in number, connected together by pipes, each pipe leading from the upper part of one still to the lower part of another still, substantially in the manner and for the purposes above set forth.

3. In connection with a still, for distilling petroleum, and other distillable substances, the use of a float, *s*, with suitable index-lever *l*, arranged and operated substantially as and for the purposes hereinbefore set forth.

78,924.—CUPOLA-FURNACE.—Norman Burdick, Albany, N. Y., assignor to himself, Jacob H. Shear, and Joseph Packard, same place.

I claim, 1. The use of a sliding bottom to a cupola furnace, constructed substantially in the manner and for the purpose above described.

2. The inlaying of such bottom with some non-fusible substance, substantially in the manner and for the purpose above described, in combination with the chamber of a cupola-furnace.

3. The cam levers *b b*, in combination with the bottom B B, substantially in the manner and for the purpose above described.

4. The form of the pit, in combination with a cupola-furnace, constructed substantially in the manner and for the purpose above described.

5. The bottom, B B, the wheel and axle D and E, the chain *y y*, the truck-wheels *a a a a*, the cam-lever *b b*, the guides R R, in combination with the cupola of a melting-furnace, substantantially in the manner and for the purpose above described.

78,928.—ORE-ROASTING FURNACE.—David C. Collier, Samuel Cushman, and Newell E. Farrell, Central City, Colorado Territory.

We claim, 1. An apparatus for roasting and chloridizing ores, composed of a cylinder, A, rotating on an axis inclined to the true axis of the cylinder, within which, in the line of the rotating axis, is a partial partition for receiving and retaining the ore for a short time at each semi-rotation of the said cylinder A, in combination with a fire-box J, and flue K, substantially as shown and described, and for the purposes set forth.

2. The wheels B, in combination with a rotating cylinder A, substantially as shown and described, and for the purposes set forth.

3. The partial partition, in a plane in the centre of the rotation of the cylinder A, and placed at right angles to a line drawn from the man-hole H or I to the said partition, or its equivalent, and in combination therewith, and with any fire-box J, substantially as shown and described, and for the purposes set forth.

79,034.—STAMP MILL.—Richard Uren and John Walker, Houghton, Mich., assignors to themselves and John Uren, same place.

We claim, 1. The supplementary cylinders H H' and pistons J J', in combination with the cylinder G, piston F, stamp C, and coupling D, substantially as described for the purpose specified.

2. The supplementary pistons J and J', in combination with the yokes K K1 L, stamp C, and coupling D, substantially as described for the purpose specified.

3. The rock-shaft *h*, adjustable cams *i*, fixed cam *x*, and arm *y*, in combination with the coupling D and stamp C, substantially as described for the purpose specified.

4. The crank-shaft S, cam *p*, connecting-rods W W', and valves O O', in combination with the rock-shaft *h*, cams *i x*, coupling D, and stamp C, substantially as described for the purpose specified.

5. The bracket R', lever *j*, and floats *l*, in combination with the cam *i*, stamp C, and coupling D, substantially as described for the purpose specified.

6. The horizontal shaft *a*, cam *b*, valve 2', and valve rod *d*, in combination with the coupling D, substantially as described for the purpose specified.

7. The combination of the spring-bed 23, rod *m*, spring-catch *o2*, tappet *p*, arms Y *u*, and spring *t*, substantially as described for the purpose specified.

79,076.—SAFETY-GUARD FOR MINING-SHAFT.—E. O. Loermo, Gold Hill, Nevada.

I claim, 1. The combination, with a railroad track and the cage of a mining-shaft, of the automatic safety-guard attachment, substantially as and for the purpose described.

2. The combination of the spring-buffer, H, spring-lever, E, and slide D, substantially as and for the purpose described.

79,152.—MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mt. Solon, Va.

I claim, 1. The use of manganese, in combination with common salt, substantially in the manner and for the purposes herein set forth.

2. The use of Epsom salts in the treatment of iron in the furnace, for the purpose of purifying the iron.

3. The method of treatment herein described for reducing and purifying the ores and the metal, and for securing uniformity in the quantity of the metal produced.

79,158.—PLATFORM FOR ROCK-DRILLS.—Peter Sweeney and John Bradburn, New York, N. Y.

We claim, in a drill-stand, rendered adjustable by means substantially as shown, the adjustable guides, C C constructed and operating substantially as and for the purpose set forth

MARKET REVIEW.

FRIDAY EVENING, July 3, 1868.

Gold and Silver Stocks.—Nevada Stocks are weak and dull It would be difficult to give the price at which any stock could be sold, so unsettled is the market. Colorado stocks rule lower in some instances, but last week's prices are generally sustained, as will be noticed by reference to our quotations printed below.

	Bid.	Asked.		Bid.	Asked.
Alameda Silver	— —	1 00	Kipp & Buell Gold	— —	— 15
American Flag	— —	— 60	Keystone Silver	— 1	— 2
Atlantic and Pacific	— —	— 80	La Crosse Gold	— 42	43
Bates & Baxter Gold	— —	1 00	Liberty Gold	— 3	— 5
Benton Gold	— 30	— 40	Liebig	— —	— 4
Black Hawk G	— —	7 50	Manhattan Silver	115 00	— —
Bobtail Gold	— —	1 30	Midas Silver	— 40	— —
Bullion Consolidated	— 60	— —	Montana Gold	— 60	— 65
Burroughs G	— 10	— —	New York	— 60	73
Columbian G. & S.	— 4	— 10	New York & Eld'o	— —	1 75
Combination Silver	10 00	20 00	Nye Gold	— 2	— 3
Consolidated Gregory	5 00	5 05	Owyhee Mining	20 50	30 00
Corycon Gold	— 30	— 40	Con. Colorado	10	— —
Edgehill Mining	— —	4 30	People's G. & S. of Cal	— 5	— —
Empire G	— —	2 60	Quartz Hill	1 10	1 20
Gold Hill	— —	1 00	Reynolds Gold	— —	— 4
Grass Valley	— 25	— —	Rocky Mountain Gold	— 10	— 20
Gunnell Gold	— 60	1 50	Smith& Parmelee Gold	3 70	3 75
Gunnell Union	— —	— 30	Sensenderfer	— —	10 00
H'n G & S. bs	— —	— 85	Symonds Fork Gold	— —	1 00
Harmon G. & S. bs	— —	3 00	Texas Gold	— —	— 10
Holman	— 4	— 10	Twin Riv Sil	— —	40 00
Hope Gold	— —	— 20	Vanderburg G	— —	— 70

Copper Stocks.—Prices are thus quoted at the stock board :

Caledonia C	— — 5 00	Gardiner Hill	— — 1 00
Canada	— — — 50	Hancock C	— — 5 00
Charter Oak	— — 1 00	Hilton	— 50 1 00
Copper Falls	22 00 — —	Isle Royale	— — 4 00
Davidson	— — — 75	Knowlton	— — 2 00
Evergreen B	— — 10 00	Minnesota	— — 4 00
Franklin C	14 50 — —	Ogima	4 00 6 00
French Creek	— 10 — 15	Rockland	— — 4 00

Petroleum Stocks.—Bennehoff Run is lower ; prices of other stocks are well sustained, and are thus quoted :

	Bid.	Ask'd.		Bid.	Askd.
Bennehoff Run	50	1 00	N. Y. and Alleghany	....	2 50
Brevoort	....	50	Pit Hole Creek	50	1 00
Buchanan Farm	45	48	Rynd Farm	14	16
Central	25	....	Second National	....	20
Continental	1 10	....	Sherman & B	....	....
Empire & Pithole	....	10	Tarr Farm	30	40
Home	50	....	United Pet. Farms	5	12
Manhattan	....	5	Union ex div	4 00	....
National	1 00	3 00	United States	2 30	2 40

Miscellaneous Stocks.—Del. & Hudson Canal, 140 ; Cumberland Coal, pref., 34 ; Mariposa pref., 8¼ ; Adams, 53⅛@53⅜ ; American, 47@48½ ; United States, 44¼@44½ ; Wells, Fargo & Co., 24½@25 ; Merchants' Union 24 ; National, 27¾@27½ ; Walkill Lead, 18@20 ; Tudor Lead, 2 15 ; Rutland Marble, 17 ; Brunswick C. L., 9 75@11 25 ; Erie, 69¾ ; Reading, 101¾ ; N. Y. Central, 134@134½.

Government Stocks are heavy and depressed, in sympathy with the proposal in the House to subject bonds to taxation. Prices are quoted :

U. S. 6s, 1881, coupon.....112⅞@113
U. S. 5-20s, 1862, coupon.....112¾@113
U. S. 5-20s, 1864, coupon.....110⅛@110⅜
U. S. 5-20s, 1865, coupon.....110⅜@110¾
U. S. 5-20s, July, 1865, coupon.....118¾@118⅞
U. S. 5-20s, July, 1867, coupon.....108⅛@108⅜
U. S. 5-20s, July, 1868, coupon.....108½@108¾
U. S. 10-40s, coupon.....106⅛@106¼
U. S. 7-30s, July, large.....108½@108¾

Foreign Exchange is firm, but not very active. Leading bankers quote rates as follows :

London, (prime bankers')60 days'.....110⅛@110¼
London, (prime bankers') sight.....110½@110⅝
London, prime commercial.....109¾@110
Paris, (bankers') long.....5.13¾@5.12½
Paris, (bankers') short.....5.11¼@5.10
Antwerp.....5.16¼@5.15
Swiss.....5.16¼@5.15
Hamburg (bankers').....36⅛@36¼
Amsterdam (bankers').....41⅜@41½
t (bankers').....41 @41¼
Bremen (bankers).....79¾@80
Berlin (bankers).....71⅞@72

Gold is firm at 140½@140¾.

American silver is selling moderately at 6½@7¼c. below the price of gold. Mexican dollars are quoted at 103¼@103¾ in gold.

Money shows rather more activity. Some of the 3 per cent. loans have been marked up to 4 per cent., and in some cases 5 per cent. is asked on new transactions.

There is a slight increase in the amount of bills offering for discount, and at bank 6@7 per cent. is generally demanded on prime names.

The following will show the exports of treasure from this port for the week ending June 27, 1868, and for the year to that date :

Total for the week.....$2,530,134
Previously reported.....45,593,159
Total since January 1, 1868.....$48,123,293

Antimony—16@16¼.

Nickel | $1 25@1 75, gold.

Bismuth—$5 75@6, gold.

Petroleum—Is quiet, but steady, at 16c. for crude, and 32c. for refined, in bond.

The following will show the movements of petroleum at this port to June 30th :

Receipts for the week	pkgs.	15 359
Exports for the week	galls.	1,550,469
Do. from January 1	do.	22.394,289
Do. same time last year	do.	14,750,682

The following is the quantity exported from other ports, Jan. 1 to June 27 :

		1868.	1867.
From Boston	galls.	1.295 06)	917,088
	Philadelphia	15,137.736	11.097,966
	Baltimore	1,047 546	1,049,333
	Portland	153,131	....
	Total	17,543,473	13.064,387
Total exports from the United States		40 276,917	27,782,570
Same time in 1866			25,350,065
Same time in 1865			4,994,099

THE IRON TRADE.

NEW YORK, Friday evening, July 3, 1868.

In Scotch pig iron the market is firmer, and most of the lots here at the docks have been sold, and shipments have fallen off. The sales have been five to seven hundred tons from ship, at $38 50@39 00 for Glengarnock ; 400 tons from yard, at $40 for Eglinton, and $42 for Gartsherrie.

In American there is not much movement ; No. 1 is still in small supply at $33 for best brands. Hard irons are in full supply. About 2,000 tons scrap iron has been sold to arrive here and for future shipment. Scrap is firmly held at $47 50 from yard, and $46 50 from vessels.

Old rails are in good demand at full prices. Sales have been made of 1,500 tons old T-rails, delivered out of town, at $49 ; 500 tons old double heads to arrive at $48@49.

New rails are quiet.

Bar from store continues dull.

BOSTON, July 1, 1868.

The pig iron market continues steady, with a fair demand. We note sales of Gartsherrie and other brands Scotch No. 1 at $42@44, and American at $38@45 per ton. In bar iron there are steady sales at $85@90 for common English and American, and $95@100 for refined. Russia sheet iron is quiet but firm at 13@14c. per lb. gold.

Imports of pig iron from Jan. 1 to June 27 :

	1868.	1867.
From Great Britain, tons	5,245	17,697
Coastwise ports	5,370	3,981

PHILADELPHIA, June 27, 1868.

Pig metal is held with much firmness, but there is no activity. Sales of 600 tons No. 1 foundry at $37@38 ; No. 2 do. at $35@46 ; 100 No. 3 at $33 ; 300 tons grey forge at $30@32 ; and 600 tons Lebanon white and mottled at $29. About 2,500 tons Allentown No. 1, deliverable in New York, sold at $38@38 50.

Scotch pig is quiet, and without sales.

Manufactured iron is steady at full prices. A sale of 200 tons old double-headed and T-rails at $48 per ton.

Blooms—Prices are nominal.

Comparative Table of Iron and Steel Imports from Great Britain.

The following statement exhibits the quantities of the various kinds of iron and steel exported from Great Britain to the United States, during the first four months of the years 1867 and 1868, in tons of 2,000 lbs. :

	1867.	1868.
Iron, Pig and Puddled	42,465	16 046
" Bar, Angle, Bolt, and Rod	16 588	10 774
" Railroad of all sorts	66 820	98,994
" Castings	171	81
" Hoops, Sheets, and Boiler Plates	7,656	3,566
" Wrought of all sorts	1,895	1,451
Total of Iron	136,595	130,940
Steel, unwrought	8,268	4,408

Lake Superior Iron Trade.

Receipts of Ore and Pig Iron at Marquette, up to and including Saturday, June 20, 1868, by the Marquette & Ontonagon Railroad.

IRON ORE.

	Previously reported.	For week end'g June 20.	Total.
Lake Superior Iron Co	18,915	5,241	24.156
Cleveland Iron Co	8,263	2,383	10,646
Marquette Iron Co	2,754	541	3.295
Washington Iron Co	7,464	1,152	8.618
New England Iron Co	2,381	....	2,381
Edwards Mine	3,172	490	3.662
Pittsburg & Lake A. Iron Co	5,635	743	6,378
Ore to Local Furnaces	6,738	779	7,517
Total Iron Ore, tons	55,324	11,329	66,653

PIG IRON.

Morgan Iron Co	2,898	....	2,898
Greenwood Iron Co	328	....	328
Bancroft Iron Co	1.591	....	1,591
Collins Iron Co	1,028	....	1,028
Michigan Iron Co	2,244	....	2.244
Total Pig Iron, tons	8,089	787	8 089
Total Ore and Pig Iron, tons	63,413	11,329	74,742

Market Prices.

NEW YORK, July 3, 1868.

DUTY.—Bars, 1 to 1½c. per lb. ; railroad, 60c. per 100 lbs. ; boiler and plate, 1¼c. per lb. ; sheet, band, hoop and scroll, 1¼ to 1¾c. per lb. ; pig, $9 per ton ; polished sheet, 3c. per lb. Payable in gold.

Anthracite, No. 1, best.	$33 00@40 00	STORE PRICES.	
" " 2x, fdry,	36 00 38 00	Bar, Swedes, ord'y sizes	— — 150 00
" Grey Forge,	33 00 34 00	Bar, Eng. and Am., r'l'd	95 00 100 00
Scotch Pig, No. 1	38 50 42 00	Bar, Eng. & Am., com.	85 00 90 00
Charcoal, cash	45 00 65 00	Sceoil	125 00 170 00
Old Wrought sc'p, fm yd.	47 50 — —	Ovals and half round	120 00@150 00
" " " fm. val.	46 50 — —	Band	125 00 — —
English rails, gold	51 00 51 50	Horse Shoe	125 00 — —
American " at works.	75 00 — —	Rods, ⅜@3-16 inch	100 00 160 00
American Bar Iron.		Hoop	133 00 185 00
Common, per ton	80 00 85 00	Nail Rod, per lb	9 10
Refined, " "	85 00 90 00	Sheet, s'gle, D. & T. com	5 7
Old Railroad Iron	47 00@	Rails, Eng., gold, ton	51 00 51 50
		Rails, American	79 00 80 00

STEEL.

English, cast (2d and 1st quality) per lb	18 @23½
English Spring (2d and 1st quality)	10 @14½
English Blister (2d and 1st quality)	11½ 20
English Machinery	13½ 16
English German (2d and 1st quality)	14 16
American Blister, " Black Diamond,"	11¼ 17
American, Cast, Tool " "	21 22
American, Spring " "	10 13
American, Machinery " "	— 14
American German " "	10 13

LONDON, June 12, 1868.

In Staffordshire, says the *Mining Journal*, some degree of increased activity is reported in the demand for manufactured iron. The demand from the United States, India, and the Continent is rather better, and there is altogether an improved feeling in the trade. Owing to the strike, stocks of pigs have somewhat accumulated, but as that is virtually over, should the improved demand continue these will shortly be reduced. The recent orders for rails, and the requirements for plates for shipbuilding is diminishing the competition in the Cleveland district, so that it is hoped some orders will come to Staffordshire. In Welsh the signs of improvement in the trade are making slower progress than was anticipated a few weeks ago, and additional orders are not yet offered with freedom. This is more particularly the case on home account ; and, although some three or four of the leading railway companies are in the market for considerable quantities, the great majority of buyers are only making comparatively small purchases, just sufficient to meet immediate requirements. To the foreign markets the exports are considerable, the United States still heading the list, with the prospect of a further increase in the demand. In Swedish iron the demand still continues fair. In Scotch pig iron there has been very little fluctuation in the market during the week, the last price received from Glasgow being 51s. 6s. cash.

Bars, Welsh in Lond.	£6	5	0@..	....	Do. railway, Wales.	£5	10	0@£5	15	0
Ditto to arrive	6	2	6	6	5	0	Do. Swd. in London	10	0	0	10	5	0
Nail rods	6	15	0	7	....		To arrive	10	0	0	10	5	0
" Stafford in Lond.	7	7	6	8	10	0	Pig, No. 1, in Clyde	2	12	3	2	15	3
Bars	7	5	0	9	10	0	Do. f.o.b, Tyne, Tees	2	9	6	..	..	..
Hoop	8	2	6	9	15	0	Do. Nos 3, 4, f.o.b. do	2	6	6	2	7	0
Sheets, single	9	0	0	11	0	0	Railway chairs	5	10	0	5	15	0
Pig, No. 1, in Wales	3	15	0	4	5	0	" spikes	11	00	0	12	0	0
Refined metal, ditto	4	0	0	5	0	0	Indian Charcoal Pigs						
Bars, common, ditto	5	10	0	5	15	0	in London, pr. ton	7	0	0	7	10	0
Do. merch. Tyne or Tees	6	10	0	....									

STEEL.

Swed., kegs (rolled)	14	5	0	..	..	..	Swed., in faggots	16	..	..	..	..	0
" (hammered)	14	15	0	15	00	0	English, spring	17	..	..	23	..	..

THE COAL TRADE.

NEW YORK, July 2, 1868.

A telegram informs us that a strike has occurred in the Schuylkill region on the eight hour law, and that all the collieries have stopped.

This is news of great importance to the trade here, for should a stoppage of work continue for any length of time, and eventually draw the Lehigh and Lackawanna regions in, it would materially advance the price of coal. We have for a long time warned our readers of the danger of putting off the time for laying in their supply of coal, urging them that some unforseen accident might interfere, which would advance the price. Now they see how true our predictions were, and if they try the market trade they will find it out only to their cost.

The following are the rules adopted by the leading railroads and corporations, in relation to the eight hour law :

"LEHIGH VALLEY RAILROAD COMPANY.

NOTICE TO ALL EMPLOYEES.

On and after July 1st, 1868, no person employed by this company will be paid by the day.

All persons who work a definite number of hours per day, will be paid by the hour, at the same rate now paid.

All persons engaged in running on the road in any capacity, and heretofore paid by the day, will be paid by the trip.

The rate of pay for all other persons, heretofore paid by the day, will be changed to a rate per hour, per trip, per week, or per month.

ROBERT H. SAYRE, Sup't and Eng'r.

OFFICE OF SUP'T and ENG'R, Bethlehem, June 24, 1868."

Freights remain unchanged. Vessels are in somewhat better supply.

BOSTON, July 1, 1868.

The market for English Cannel is quiet, and the sales have been confined to small lots at $20 per ton ; Pictou sells at $7 50@7 75 ; and Sydney at $8@8 25 per ton ; Cumberland is steadily at $8@8 25 here, $4 75 in Baltimore, and $4 35 in Georgetown ; Pennsylvania and Westmoreland gas has been selling at $7 20 per ton ; Anthracite has been selling at $6@6 50 by the cargo, and $7@7 50 in retail lots.

PHILADELPHIA, June 27, 1868.

The market continues dull, the inquiry being limited and confined to first class coals. If prices do not soon improve, work at the mines will be suspended for a short time. The strike at Port Richmond is over, and the workmen are now engaged at advanced wages.

The following table exhibits the quantity of Coal passed over the following routes of transportation for the week ending June 27, 1868 :

	1867. WEEK.	1867. YEAR.	1868. WEEK.	1868. YEAR.	INC. OR DEC WEEK.	INC. OR DEC YEAR.
Phil. & Reading R. R.	81,593	1,557,298	65,311	1,557,853	i 16,282	i 555
Schuylkill Canal	33,111	397,270	38,514	399 951	d 5,403	i 2,681
Lehigh Valley R. R.	51,192	961,079	52,120	1,223,149	i 929	i 262,070
Lehigh Canal	39,561	298,202	29,019	317,914	d 9.542	i 19,712
Scranton North	11,397	192.741	14,158	227,952	i 2,761	i 35 211
" South	25,459	618,098	21.111	528,261	d 4,348	d 89.837
Penn'a Coal Co. Rail	21 810	359,030	22,306	405,016	i 496	i 45.986
Penn'a Coal Canal	1,000	7,046	1,066	9,912	i 1,066	i 2,866
Del. & Hudson Canal	43,942	499,717	50,722	540,625	i 6,780	i 40,908
Shamokin	12,835	224,788	12.934	222,151	i 129	d 2,637
Trevorton	36	20,655	395	10,366	i 358	d 10 289
Short Mountain	2,339	47,134	3,734	30,253	i 1,395	i 16 880
Lykens Valley C. Co.	.....	24,711	.....	37,220	.....	i 12,509
Broad Top	.....	115,233	.....	101,851	.....	d 13 382
W'mstown Col'y, E.	3 041	48 085	4,384	83,431	i 1,353	i 35 346
Wyoming South	10,611	49,715	8,972	77,000	d 1,639	i 27,285
Wyoming North	.....	.....	.....	1,109	.....	.....
Lehigh & Susq. R.R.	.....	.....	9,008	180,464	.....	.....
Total	335,917	5,420,802	333,784	5,954,478	.....	.....
	.....	.....	335,917	5,420,082	.....	.....
Increase	.....	.....	d 2,133	533,676	.....	.....

Report of Coal Transported over Lehigh Valley Railroad and Canal

For the week ending June 27, 1868, compared with same time last year :

SHIPPERS.	RAILROAD. Week. Tons.	RAILROAD. Total. Tons.	CANAL. Week. Tons.	CANAL. Total. Tons.	Grand Total.
FROM MAUCH CHUNK.					
Summit Mines	....	....	11,355	126,324	126.324
Room Run Mines	....	....	1.403	9,356	9,356
Total	....	....	12,758	135,680	135,680
WYOMING REGION.					
Franklin Coal Co	1,221	5,685	....	....	5,685
Audenried	....	50	....	....	50
Lehigh & Susquch'na	....	....	....	....	....
Germania Coal Co	9	4,045	280	2,971	7,116
Wilkes Barre C. & I	376	13,542	3,370	37,864	51,405
Warrior Run	....	10,710	....	....	10,710
Parish & Thomas	837	31.579	....	3.148	31,727
New Jersey	280	10,398	124	2,229	12,627
Union Coal Co	....	2 432	....	....	2 432
Wyoming C. & T. Co.	....	3,227	....	....	3,227
East Boston Coal Co.	....	....	....	256	256
Morris & Essex Mut'l	....	1,428	....	....	1.428
Chauncey Coal Co	....	....	472	1,789	1.789
Hillman & Son	203	7,108	....	....	7,108
Bowkley, Price & Co.	....	149	....	....	149
Mineral Springs	650	11,368	....	....	11,368
Valley Coal Co	....	....	....	....	....
Enterprise C'y, J. H. S	665	17,163	....	446	17,609
G. B. Linderman & Co	....	....	....	....	....
Washington Coal Co.	....	....	....	....	....
West Pittston	....	197	....	....	197
John Horton	....	....	89	756	756
Shawnee	208	4,237	652	3 934	8,171
Consumers Coal Co.	....	2,160	....	....	2,160
Harvey & Bro.	....	2.408	....	183	2,591
Wyoming Valley	187	2,981	....	....	2,981
Henry Colliery	....	513	....	....	513
New England	444	3,666	....	....	3,666
Del. & Hudson C. Co.	....	11	....	46	57
Other Shippers	....	29	....	1,311	1,340
Total	5 086	131,162	4,989	54,036	185,198
FROM S. M. REGION.					
N.Y. & L. [T.H. & Co	1,767	33,756	374	1,415	35,171
Honey Brook Coal Co.	2 530	60,449	1,775	11,811	72.260
Ger Pa. Coal Co	1,288	25.801	562	2 883	28.684
Spring Mountain	3,210	60,931	94	1 023	61.054
Coleraine W.T.C. & Co	1,528	41.074	917	6,416	47,490
B. Meadow (D. W.)	54	468	....	....	468
John Connery	...	....	....	....	....
Lehigh Zinc Co	....	....	....	....	....
Spring Brook	....	....	....	....	....
Other Shippers	6	233	....	266	499
Total	10,386	211,428	3,725	23,815	235,243
HAZLETON REGION.					
Central Coal Co	....	....	....	....	....
Ashburton Coal Co	....	433	....	64	497
Mt. Picasant [Halsey	....	8,844	66	946	9,790
Hazleton (A. P. & Co)	5 338	140,830	1,514	22,734	163,564
East Sugar Loaf	4 158	91,291	....	756	92.047
Mount Hall	....	219	....	....	219
Latimer (A. P. & Co)	1,901	23,315	188	2,166	25.481
Stout Coal Co	1.154	20,422	286	4,348	24,770
Harleigh Coal Co	1,594	30.222	853	6,733	36,955
Ebervale Coal Co	1.897	45,024	1,021	9,478	52,502
Jeddo (G. B. M. & Co)	3,059	77.381	999	15,712	93 093
Woodside (J. C. Co.	407	8 974	153	3,480	12 454
Highland	908	32,680	220	6,881	39,561
Cross Creek (C. B.)	682	14,016	188	2,872	16,888
C'l Ridge [S.W. & Co.	2,950	52,411	851	13,647	66,1 8
Buck Mountain	1,429	31,141	373	5 044	36,185
Other Shippers	....	....	93	2,245	2,.45
Total	24,779	550,490	6,828	97,102	64,759
U. LEHIGH REGION.					
U. Lehigh Coal Co	705	30,172	627	6,246	36,418
Other Shippers	....	....	....	....	....
Total	705	30,172	627	6,246	36,418
MAHANOY REGION.					
Mt. Rose Coal Co	....	1,177	....	....	1,177
Mount Etna Coal Co	....	3.380	....	854	4,234
Mahanoy Col. [N.M.M	....	13,423	....	....	13,423
Coplay Colliery	760	14,832	....	....	14,832
Glendon	1,192	22,317	....	....	22.517
Primrose Colliery	....	6.947	....	....	6,947
E. S Silliman	1,771	51,680	....	....	51,680
McNeal Co	3,300	45,319	....	....	45,319
Knickerbocker	894	32,542	....	....	32.542
Thomas Coal Co	1,027	19.247	....	....	19.247
Williams & Herring	334	5,769	....	....	5,769
New Boston Coal Co.	1,420	28,206	90	90	28,206
Shamokin Coal Co	....	....	....	....	....
Caledonia M. & M	469	12,783	....	....	12,783
Coal Run Cataw'sa RR	....	....	....	....	....
Other Shippers	....	15	....	88	103
Total	11,162	259,643	90	1,033	260,676
Grand Total	52,120	1 223.149	29,018	317,914	1,541,063
Same time last year	51.191	961,078	38,561	298.202	1,259,280
Increase	923	262 070	....	19,712	281,782
Decrease	....	....	9,542	....	9,542

Lehigh and Susquehanna Railroad, Week ending June 27.

WHERE FROM	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
WYOMING REGION.		
Haverill	.....	.....
Newport Coal Co	.....	.....
Valley Coal Co	.....	.....
Warrior Run Mining Co	.....	.....
Parrish & Thomas	.....	5,278 02
New Jersey Coal Co	509 07	7,407 09
Joseph Stickney & Co	89 00	89 00
Lehigh & Susquehanna	.....	15 10
Germania Coal Co	280 16	9,397 04
Franklin "	.....	.....
Audenreid Improvement	.....	.....
Wilkesbarre Coal & Iron Co	8,530 15	95,275 03
Union Coal Co	.....	2,040 07
Mineral Spring	.....	6,029 06
H. B. Hillman & Son	.....	1,303 17
Bowkley, Price & Co	.....	2:8 14
Wyoming	.....	3 006 09
Henry	188 18	2,758 08
J. H. Swoyer	.....	2,739 06
Everhart Coal Co	.....	.....
Albrighton, Roberts & Co	472 16	1,789 06
Shawnee	936 01	5,288 03
Morris & Essex Mutual	.....	78 19
Delaware & Hudson Co	255 04	4,592 10
Pine Ridge Colliery	158 09	1,310 14
Consumers Coal Co	171 05	1,365 12
Harvey & Brothers	.....	184 11
Total Wyoming Region	11,622 11	150,178 0

UPPER LEHIGH REGION.		
Upper Lehigh	2,675 03	55,750 01
Total Upper Lehigh	2,675 03	55,750 01
HAZLETON REGION.		
A Pardee & Co	1,553 92	27,506 14
Linderman & Skeer	.....	766 06
Sharpe, Weiss & Co	879 08	18,413 13
W. S. Halsey & Co	122 10	1,701 09
Harleigh Coal Co	858 07	12,796 15
G. B. Markle & Co	1 079 02	21,199 07
Ebervale Coal Co	1,921 07	12,558 16
Stout Coal Co	315 18	6,797 10
Buck Mountain Coal Co	416 15	7,227 05
Coxe Brothers & Co	241 07	3,822 10
Ashburton Coal Co	.....	64 06
Highland Coal Co	227 07	7,279 09
Pardee Bro. & Co	188 10	3,712 09
Jeddo Coal Co	158 08	4,285 17
Mount Hall	.....	.....
Other Shippers	.....	927 02
Total Hazleton Region	7,062 01	129,049 08
" Upper Lehigh	2,675 03	55,750 01
" Wyoming	11,622 11	150,178 01
Grand Total	21,359 15	334,977 10
Corresponding week last year	9,166 06	242,831 03
Increase	12,193 09	92 346 07
Decrease	.....	.....
Forwarded South from Mauch Chunk by rail	8,543 02	151,308 01
Delivered on line L. & S. R.R. above Mauch Chunk	464 16	28,655 05
Delivered at Coal Port for shipment by Canal	12,351 17	154,514 04
Total	21,359 15	334,977 10

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, July 4, 1868.

Schuylkill R. A., choice	$5 50@$....		Schuylkil Chestnut	4 00	....
" Ordinary	5 25	....	Lehigh W.A Lump Old Co	5 00	...
" W. A., Lump	5 00	....	Lehigh Broken	4 87½	....
" Steamboat	5 00	....	" Egg	4 87½	....
" Broken	5 00	....	" Stove	5 12½	....
" Egg	5 25	....	" Chestnut	4 37½	....
" Stove	5 25	....	Shamokin	5 50	....

SPECIAL COALS.—DEALERS' QUOTATIONS.

Diam'd Vein R. A., Sch'kill	5 50	....	Old Co.'s W. A. Lehigh	5 50	....
Locust Dale W. A., "	5 50	....	Mt Pleasant	5 00	....
Honey Brook " Lehigh	5 50	....	Broad Mountain	....	....
Harleigh " "	5 50	....	Buck Ridge W. A., Sch'kin.	5 50	....
Spring M'n " "	5 50	....	H. Heils, E. S'kiln, Lorb.	5 50	....
Sugar Creek " "	5 50	....	New England Red Ash	5 25	....
Ashburton " "	5 50	....	Wyoming	5 50	....

Dealers in these Coals may be found in our advertising columns.

At Philadelphia, July 4, 1868.

Lehigh Lump and Sc'mb't.	5 00@....		Henry Clay, Egg & Stove	....@4 40	
" Broken and Egg	5 00	....	Locust Mount Lump and Steamboat	3 25	3 40
" Stove	5 50	....	" Broken	3 35	3 60
" Chestnut	4 25	...	" Egg	3 60	4 00
Schuylkill R. A.	4 25	4 50	" Stove	4 00	4 15
" Chestnut	2 60	....	Lorberry Coal	4 50	....
" W. A. Lump	3 25	....	Shamokin	....	....
" Broken	3 25	3 50	Franklin, (Lykens Valley)	5 00	....
" Egg and Stove	3 40	4 10	Broad Top	4 60	....
Schuylkill Chestnut	2 75@....				
Hill & Harris, Egg & Stove	....	4 30			

Scranton Coal at Elizabethport, July 4, 1868.

(Corrected weekly by D. L. & W. R. R. Co.)

Lump	$4 00@....		Egg	4 50	....
Steamer	4 25	....	Stove	5 00	....
Grate	4 50	....	Chestnut	4 25	....

Prices for Pittston Coal at Newburgh, July 4, 1868.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton of 2240 lbs.	$4 20@....		Egg " " "	4 30	....
Steamer, " " "	4 20	....	Stove " " "	4 65	....
Grate " " "	4 30	....	Chestnut " " "	4 15	....

70 cents additional to New York.

Lackawanna at Rondout, July 4, 1868.

Lump	$4 30@....		Egg	$4 40@....	
Steamer	4 35@....		Stove	4 75	....
Grate	4 30@....		Chestnut	4 20	....

65 cents additional to New York.

Lehigh Coal at Elizabethport, July 4 1868.

Lump	5 00@....		Chestnut	4 25	....
Steamboat and Broken	4 75	....	Stove	5 00	....
Egg	4 75	....			

Wilkesbarre Coal at Hoboken, July 4, 1868.

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump	$4 25@....		Egg	4 45@....	
Steamer	4 45	....	Stove	4 55	....
Broken	4 45	....	Chestnut	4 25	....

At Baltimore, July 4, 1868.

Wilkesbarre & Pittston W. A. by car	$5 25@5 50	From wharf or yard, 50c. to 75c per ton additional	
Lykens Valley R. A. by car	@ 5 55	Ret il, del'd, per 2,240 lbs	7 00@7 50
Sunbury & Shamokin R. or W A. by car	5 00 5 50	George's C'k and Cumberland f. o. b. at Locust P't for shipping	@4 75

At Havre de Grace, Md.

Wilkesbarre or Pittston, W. A., on board	$...@4 85	Sunbury or Shamokin, R. or W. A., on board	....@4 85
Trevorton R. A., on board	.... 5 25	Lykens V'y, R. A. on b'd.	....@5 50

Havre de Grace is the terminus of Susquehanna and Tide Water Canal.

At Georgetown, D. C. and Alexandria, Va.

George's Creek and Cumberland f. o. b. $....@ 4 35

Prices of Gas Coals.

July 4, 1868.

PROVINCIAL.	Duty, $1 25	Coarse. Gold.	Slack. Gold.	AMERICAN	Coarse. Currency.	Slack. Currency.
Block House	$1 75	$ 75		Westmoreland Co.	$8 50	$8 00
Gowrie	1 75	75		Despard Coal Co.	8 25	8 00
Lingan	1 75	75		Penn	8 50	8 00
Sydney	2 13¾	71¼		Newburgh Orrel Gas	8 50	8 00
Pictou	2 13¾	1 18¾		Delivered in New York.		
Little Glace Bay	1 75	1 00				
International Co.'s	1 75	....				

Prices of Foreign Coals.

Duty $1.25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine Street, N. Y.

Liverpool Gas Caking	$ 9 50	Liverpool House Cannel	18 00@19 00
" " Cannel	14 00	" " Orrel	16 00@18 00

Per ton 2240 lbs., Ex. ship.

PRICES FROM YARD:

Liverp'l House Orrel, scr'd	$18@20	Liverp'l House Can'l, scr'd.	22 00@— —

per ton 2000 lbs. delivered.

Coal Freights.

(Corrected Weekly.)

Rates of Freight from Newburgh

RIVER.		EASTERN.	
On "Pittston" Coal, by boats and barges of the Pennsylvania Coal Company, per ton of 2,240 lbs.		Stamford	$1 25
Troy and West Troy	$ 55	Norwalk	1 25
Albany and Greenbush	50	Bridgeport	1 25
Coeymans	45	New Haven	1 25
Coxsackie and Stuyvesant	40	New London	1 40
Hudson & Catskill	35	Norwich	1 50
augerties and Barrytown	35	Mystic	1 45
hinebock and Rondout	30	Stonington	1 45
o'keepsie and New Paltz Land.	25	Sag Harbor	1 45
		Bristol	1 45
		Newport	1 55
		Fishkill Landing	20
		Cold Spring and West Point	30
		Peekskill	40
		Haverstraw	45
		Sing Sing and Nyack	50
		Tarrytown and Piermont	50
		Yonkers	55
		Fall River	1 55
		Providence	1 60
		Dighton	1 60
		Warren	1 60
		Pawtucket	1 75
		New Bedford	1 90
		Boston	2 10
		East Cambridge	2 20
		Salem	2 10
		Newburyport	2 20
		Portsmouth	2 15
		Portland	2 00

The Coal must be discharged with all reasonable dispatch, at the expense of the consignee, who shall also pay wharfage on the boat. Boatmen will tend guy while unloading.

Freights on Coal Sea-borne from Port Richmond, Philadelphia.

June 24, 1868.—From Philadelphia & Reading Railroad Wharves, Phila., to

Boston	2 55	2 65	New York	— —	1 30
Portland	2 60	2 70	Rockland	— —	2 60
Salem	2 60	2 65	Chelsea	2 60	2 65
Providence	2 00	2 10	Charlestown	2 60	2 65
Cambridge	2 60	2 65	Dighton	— —	2 17
New Bedford	— —	2 15	Lynn	2 75	2 80
Dorchester	2 60	2 65	Manchester	— —	2 65
Fall River	— —	2 10	Malden	— —	3 25
Gloucester	— —	2 70	Rockport	— —	2 65
Pawtucket	2 20	2 30	Weymouth	— —	2 60
Brooklyn	— —	1 30	Wellfleet	— —	3 00
Portsmouth	2 88	2 88	Derby	— —	2 00
Roxbury	2 75	2 90	Hartford	—	2 25
Norwich	— —	2 00	New London	— —	2 00
Bangor	— —	2 45	Albany	— —	1 50
Calais	— —	2 60	Troy	— —	1 40
Hallowell	— —	3 15	Hackensack	— —	1 85
Gardner	— —	3 00	Savannah	1 50	2 00

From Elizabethport and Port Johnston.

Albany	$ 85@—	—	New London	$1 15	— —
Boston	2 00	— —	Newport	1 40	— —
Bridgeport	1 00	— —	New York	60	— —
Fall River	1 45	— —	Norwalk	1 00	— —
Hartford	1 50	— —	Norwich	1 35	— —
Hudson	1 00	— —	Pawtucket and towing	1 60	— —
Lynn	— —	— —	Portland	1 90	— —
Middletown	1 25	— —	Portsmouth	2 10	— —
New Bedford	1 50	— —	Providence	1 10	— —
Newburyport	2 15	— —	Salem	1 75	— —
New Haven	1 00	— —	Augusta	2 25	— —

Rates of Transportation to Tide Water.

[BY RAILROAD.]

To Port Richmond.—(Philadelphia.)

Philadelphia and Reading R. R. from Schuylkill Haven $2 00

The following are the drawbacks allowed on all coal shipped East of New Brunswick and South of Cape Henry, until further notice:

	Drawback.	Freight.	Nett.
Lump	$1 25	$2 00	$ 75
Steamboat	1 15	2 00	85
Broken	1 00	2 00	1 00
Egg	65	2 00	1 35
Stove	50	2 00	1 50
Chestnut	75	2 00	1 25

From Port Carbon, 8 cents per ton more.

To Elizabethport.

L. V. Railroad from Mauch Chunk to Easton	$ 69
C. R. R., N. J., Easton to Elizabethport	1 06
	1 75
Shipping Expenses at Elizabethport	25
Total	2 00

To Port Johnson.

L. V. R R.	$ 69
C. R. R of N. J.	1 12
Shipping Expenses	25
Total	2 06

To Hoboken.

L. V. R.R.	69
Morris & Essex R.R.	1 12
Shipping Expenses	25
Total	2 06

[BY CANAL.]

To Port Richmond.

From Schuylkill Haven to Port Richmond	$1 00
Freights and tolls by Raritan Canal	1 90
	2 90
Drawback	30
Total	2 60

To New York.

From Mauch Chunk to New Brunswick, by Lehigh, Del. Div. and Del. & Raritan Canal	$ 90
Freights through	1 25
Towage	20
	2 35

To New York via Morris Canal.

Lehigh Canal	$ 34
Morris "	40
Towage	10
Freight	1 55
Total	2 39

Expenses from Mauch Chunk to Jersey City for Re-shipment.

Lehigh tolls (net)	$ 34
Morris "	34
Freight	1 50
Re-shipping	30
Total	2 48

Provincial Freights.

TO NEW YORK.		TO BOSTON.	
Sydney	....	Sydney	$2 75
Lingan	....	Lingan	2 75
Cow Bay	....	Cow Bay	....
Port Calidonia	$3 00	Port Calidonia	2 50
Little Glace Bay	3 00	Little Glace Bay	2 5

Foreign Freights.

New Castle and Ports on Tyne	£13@15 keel
Liverpool	12s. 6d.@15s. ton.

New York Imports of Metals, &c.

The following will show the imports of Metals, &c., at the port of New York from foreign ports, for the week ending June 23, 1868. The quantity is given in packages, unless otherwise specified.

Metals, &c.	Quantity.	Value.	Metals, &c.	Quantity.	Value.
Brass Goods	7	570	Metal Goods	632	16,423
Bronzes	5	525	Needles	10	4,266
Copper	..	321	Nickel	9	5,377
Cutlery	35	12,748	Old Metal	....	2,484
Anvils	101	981	Platina	2	3 874
Guns	43	5,006	Percussion Caps	7	871
Hardware	59	9,226	Saddlery	2	742
Iron, hoop, tons	59	2,670	Steel	10,614	155,632
Iron, Pig, tons	1,753	25,161	Tin, boxes	27,752	166,549
Iron, Railroad bars	25,087	134,308	Tin slabs, 2,119	129,115	21,489
Iron, other, tons	2,308	64,692	Wire	5	779
Lead, Pigs	5,452	27,743	Zinc	265,542	15,155

BOSTON STOCK MARKET.

(By Telegraph.)

BOSTON, July 2, 1868.

The following were the prices of mining stocks bid to-day:

Calumet	27	Quincy	21½
Copper Falls	19¼	Cary Improvement	11⅛
Franklin	11	Isle Royal	—
Hecla	40	Water Power	17¾
Hancock	2¼	Bos., Hart & Erie RR	14⅛
Minnesota	3	Rockland	—

SAN FRANCISCO STOCK MARKET.

A Telegram from San Francisco, dated June 29, to Messrs. LEES & WALKER, Bankers, 33 Pine street, this city, quotes stocks as follows:

STOCKS.	Bid per ft.		STOCKS.	Bid per ft.	
Gould & Curry	111	@ —	Belcher	No sales.	
Savage (per share)	158	@ 159	Uncle Sam	—	@ ..
Chollar Potosi	265	@ 270	California	..	@ ..
Ophir	13	@ —	Imperial (per share)	..	@ ..
Hale & Norcross	99	@ —	Alpha	55	@ ..
Crown Point	92	@ —	Kentuck (per share)	385	@ ..
Yellow Jacket	1,190	@1,215	Cal. Steam Nav'n Co.	No sales	

London Copper Trade Circular.

Messrs. Vivian, Younger & Bond (June 16) write: Business in Chili produce has been confined to 250 tons regulus at 15s. 6d. per unit, and about 250 tons of slab at prices varying from £75 to £76 10s. according to prompt and brands. At the first-named price only about 10 tons were sold, and the figure now asked is £76 per ton Reports having got abroad that the quantity of fine copper chartered during the second half of April was 1,900 tons (instead of 1,000 tons, as was rather confidently spoken of,) coupled with the late period of dullness, induced some holders of various kinds of copper to come in as sellers, and several hundred tons of fine foreign changed hands at low rates. As we write, however, the market has somewhat recovered itself. For English raw the demand has been almost *nil*.

A Stone Bowl full of Gold.

REMARKABLE DISCOVERY OF A FRENCH COUNT WHO COUNTS HIS RICHES BY MILLIONS.

There has been one emotion in Paris during the last few days, created by the sudden reappearance in the world of Paris of the Vicomte de ——, one of the quondam favorites, who had left the city in the greatest condemnation and disgrace some seven years ago, and who returns bronzed and hardened both in mind and person to resume the place among his friends, which not they but he declared he had forfeited by his own imprudence and folly. By the kindness of a relative he was enabled to steam away for New Grenada, where he had been able to obtain a situation as clerk to the engineer just then employed in the construction of a line of railway through the country. In this position he fulfilled his small duties with the utmost perfect exactitude for more than three years, and at the end of that time, the railway being terminated, was ordered to another duty in a different part of the country. The way was over the steepest mountains. He had already got throughthe greater part of his journey when one day, overcome by the heat, he lay himself down by the side of a running stream, which refreshed him both by sight and sound, and fell to musing on the hard fate which had torn him from his relatives and friends to wander thus a lonely exile in a foreign land, when his attention was suddenly called from these high flights to a circumstance which was taking place immediately beneath his eye, and which had escaped him while gazing on the heavens. The phenomenon was this: close to where his head was lying amid the grass and flowers, the running water formed an eddy which, after turning in a tiny whirlpool, proceeded to fall into a narrow aperture, whence on examination he beheld no issue. His curiosity was aroused, and he raised himself up to gaze down into the hollow, the sides of which he found to consist of two blocks of stone, so worn down and polished by the continued rush of the current that he could see to the very bottom. The sight he there beheld made him stagger and fall back, almost without consciousness, upon the grass. In that single hollow had filtered for centuries the gold sand carried by the current from the bed of the river some miles higher up, where gold washing has been carried on for many generations. There lay before him one glittering pile of the precious ore, gleaming at the bottom of the limpid water, and demanding only a strong hand and resolute will, both of which he possessed, to draw it to the surface. Needless to say, he retraced his steps to the place whence he had departed, and soon returned, bringing back men and machinery, and as he says when telling the wondrous tale, "You may believe me if you choose, but in less than three weeks I had become the richest man in the whole republic." What bears out the assertion is the purchases he has just made of one of the mansions at the Barriere de l'Etoile, and the splendid style in which he has mounted his establishment.

"The Flying Man."

At a recent meeting of the British Aeronautical Society, it was announced by Mr. Wenham that one of the members of the society, Mr. Spencer, had constructed an apparatus by the aid of which he had accomplished the feat of raising himself from the ground level and performing a horizontal flight of 60 feet, and it was further stated by Mr. Wenham that Mr. Spencer expected to fly the length of the Crystal Palace during the meeting of the Aeronautical Society to be held there on the 25th of June. Since the above announcement was made, we have received from Mr. Spencer some particulars of the apparatus employed by him. It consists of a pair of wings of rather small size, arranged so that they can be worked by the arms; and a large fan-shaped tail of a very light construction connected to the body by basket-work, so that it stands at an angle of about 30° with the horizontal. Mr. Spencer does not profess to fly, in the ordinary sense of the term. He uses his apparatus by taking a short, quick run, this run being continued until by pressure of the air against the under surface of the tail he is raised from the ground. He then, by using the wings, maintains the momentum which he has acquired as long as possible, and is thus enabled to skim along at a short distance above the ground. Mr. Spencer commenced his operations by practicing long jumps without the aid of apparatus, and he then commenced using the wings, and finally added the tail. By continued practice, and from time to time making alterations in his apparatus, Mr. Spencer has been enabled to extend considerably his early flights or "skims," and we were informed by him a few days ago that he had lately accomplished a horizontal flight of 180 feet, starting and alighting at the ground level. Mr. Spencer is now engaged in completing a new apparatus, which he hopes to finish in time for the exhibition of the Aeronautical Society at the Crystal Palace, and we look forward with some interest to witness his performance.—*Engineering*.

☞ Mr. Kohl, in his "History of the Gulf Stream," states that the first mention was made of this current by the Swedish naturalist, Peter Kalm, in his "Travels," published in 1748. Therein he describes that remains of Mexican plants were drifted to the Faroe Islands, and even to Iceland. The first who took advantage of the Gulf Stream was Alminos, the pilot, who, in 1519, carried the despatches of Fernando Cortez to Spain. Franklin, on his becoming Postmaster General, drew a map of the Gulf Stream from the data afforded him by the whalers, and communicated it to the British authorities, who, however, were of opinion that there was nothing to learn from such "vulgar people."

☞ A German Doctor has invented an apparatus by which thunder is made visable through the object glass of a telescope. This is equally as marvellous as the hearing a "loud smell of Limberger cheese."

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☞ Mr. T. P. PEMBERTON is Editor of the Mechanical Department and Agent for the JOURNAL OF MINING.

☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "JOURNAL OF MINING," instead of "MINING JOURNAL," to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

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NEW YORK, SATURDAY, JULY 4.

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GENERAL FEATURES OF THE REPORT ON NEVADA.—SALT BEDS.—LOSS IN REDUCTION OF ORES.

As already remarked, the statistics of ROSS BROWNE upon the mineral resources of the State of Nevada cover nearly one hundred and fifty pages of his report, in full, upon all the States and Territories west of the Rocky Mountains. The Commissioner has devoted some forty pages of this amount to general descriptions, rather than to detailed statements of the condition and prospects of individual mining enterprises, though perhaps this is not an unfair proportion, more especially when we consider the fact that Nevada, in regard to her mineral resources, is as yet in a comparatively undeveloped state. The next forty pages are given to an elaborate account of the Comstock Lode, and the mines situated thereon. First, the general features of the lode, its character, length, strike, walls, width, mineral matter, etc., are succinctly, but clearly set forth. Then follows a series of pages upon the development of the mines, mode of mining, tunnelling and cost thereof, amount of ore raised, cost of mining per ton of ore, as well as other matter of a good deal of interest. Not the least interesting, as giving a detailed account of the cost of working these mines, is the section devoted to yield of the mines, net profits, etc. In this we find a detailed statement of the cost of production of a given number of tons of ore during the year ending March 1, 1867, by the Hale & Norcross Silver Mining Company. This tabulated statement cannot prove other than very serviceable to those who are now contemplating the development of other veins in that mining region. Another section sets forth in a pointed, and conclusive manner the very important and necessary relation that the projected Sutro tunnel bears, not only to the future economic success, but also in a practical point of view, to a continuation of the working of the mines of the Comstock lode for any great length of time. It would be well for those, who, from partisan motives, or other cause, are inclined to discountenance this enterprise, which, as is justly remarked, is one of the most important connected with the mining interests of the Pacific coast, to give these few pages of the report a careful reading. Whatever course they might then see fit to pursue, they would not act in utter ignorance of the real facts of the case, and their important bearing upon the future mining industries, not only of Nevada, but also of all the mineral regions of the West. The remaining sections of the report upon this State are devoted, for the most part, to an account of the condition and prospects of its eastern mining districts. Of these the Reese River District is the most important. A few pages upon the overland telegraph are added at the close of the statistics upon this State; and that, too, quite appropriately, when we consider the benefits resulting from it to the mining communities of the West, aside from the magnitude of the enterprise, its influence upon the commercial world, and the difficulties that were encountered in carrying it into effect.

In our "Gleanings from Ross Browne's Report," we have already given quite full extracts from that part of it relating to the State of Nevada, nevertheless a quotation or two may still be of interest to the general reader. It is well known that deposits of salt, of great number and extent, form as well an important item in the commercial resources of Nevada, as also a notable feature in the topography of the country. To those of our readers unacquainted with the character of these deposits, and the method by means of which salt is obtained from them, the following extract cannot fail to have a peculiar inreresst. The report reads thus:

"Like the alkali flats and mud lakes they are confined to the valleys and plains, in which they cover the points of greatest depression, the most of them being adjacent to or encompassed by a belt of alkali lands. They are doubtless of lacustrine origin, what were formerly the basins of inland seas and salt lakes, their deposition being effected through the evaporation of these bodies of water. Besides the extensive beds of this mineral occurring in Churchill, Esmeralda, and Lincoln counties, there are several deposits, as well as a number of saliniferous springs, elsewhere in the State, all of which may become of local value on account of their proximity to supposed valuable mines. The most productive bed at present is that of the Sand Spring Salt Mining Company, 75 miles east of Virginia. The claim of this company, consisting of 1,600 acres, occupies a depression in the southeastern corner of an extensive alkali flat, the centre of which for a space of several hundred acres is damp and marshy, and some portion of it covered with a few inches of water. This damp surface is coated to a depth of two or three inches with a crystallized incrustation of salt formed by sublimation of the particles of this mineral with which the clayey strata below are charged. On removing this coating of salt a thin body of fine white clay is exposed, overlying a stratum of soft black clay, which, in turn, rests upon another seam of green and black clay, containing coarse globules of salt. Beneath this seam occurs a deposit of crystalized salt, hard and massive but of an unascertained thickness. In collecting the salt at this place, a tract embracing a score of acres or more is selected, and divided into strips, from each of which, in regular order, it is scraped into large heaps with a broad wooden hoe. These heaps, after being exposed for a few days to drain and dry, are conveyed in wheelbarrows or cars running on wooden tracks laid down for the purpose of facilitating transportation over the soft ground, and thrown upon platforms or dumps, when the salt is ready for sacking and shipment to market. After one of these surface sections has been stripped of salt, the incrustation immediately begins to reform, and so rapidly do the secretions from the saliniferous clays below proceed that a few weeks, and sometimes less, is sufficient to fully replace it, admitting of the gathering of a fresh crop at least every month. As masses of the crystalized salt underlying these clayey strata are probably inexhaustible, it would seem as if this process of replenishment might go on forever. These clays are not the primary sources of supply, though no doubt serving a useful purpose in promoting by their heat the sublimation of the saline particles as well, perhaps, as in aiding their condensation upon the surface."

In speaking of the reduction of ores from the Comstock Lode under the head of "Percentage of Yield and Loss," we are told some facts that show the great importance of the cost of labor and fuel in regard to the employment of different metallurgical processes. It has been shown, by experience, that the mills now working the ores of the Comstock lode, extract only about 65 per cent. of their assay value. It seems that the percentage of gold lost, is, comparatively speaking, smaller than that of silver. This is owing to the fact that the gold is present in a free, the silver mostly in a combined state. We see that there is an annual loss of about 35 per cent. of the assay value of the Comstock ores. But we will quote this interesting paragraph in full, as it is suggestive in its character:

"The yield of bullion last year was in round numbers, say $15,000,000, which would show the loss to have been about $8,000,000. The enormous extent of this loss is well understood, but so far no feasible means of lessening it without diminishing the net profits on the result have been suggested, or at least shown to be practicable. Exceptional lots of ore will work nearer to the assay value, but only in rare instances. The great difficulty to contend with lies in the cost of labor and fuel. The average yield of all ores worked at the present time, does not probably exceed $35 per ton, equivalent to a loss of $18 90 per ton, supposing $35 to represent 65 per cent. of the assay value of the ores. If by using the Freiburg process we saved 80 per cent., the average yield per ton would be $43 12, or an advance of $8 12, which would not cover the additional cost of labor and fuel. The price charged for treatment by the Freiberg process in this district is $45 per ton, with a guarantee of only 80 per cent. Its non-applicability to low grade ores is at once apparent, the cost of reduction being greater than the average yield of the ores. To make it available, it is evident that the additional 15 per cent. of the assay value saved must cover the increased cost of reduction, which is, say, $31, so that it will prove valuable only when the ores are worth $200 per ton and upwards. In practice a lower grade than that may be adopted, it being found by experience that the percentage of loss in working ores by the wet process, increases with the greater value of the mineral. Under these circumstances we must look rather to improvements on the present modes of treating the 'tailings' from the mill by concentration or otherwise."

THE MINING LAW.

IT was anticipated, when Congress passed the law regulating mining titles, that a speedy end would be put to the confusion which had hitherto reigned in the mining States and Territories, and that every proprietor, by possessory or miner's right, would hasten to obtain a patent, under the broad seal of the United States. This expectation has not been realized. On the contrary, the number of applications for patents has been very limited; and at this rate, the reconstruction of the system of tenure of mineral lands, will not be effected in a century. The new expedient is only a new element of chaos, added to the old.

One reason why the miner does not apply for a patent under this law is very simple. It is not made compulsory; and hence, he considers the ordinary miner's title good enough, and avoids the unnecessary expense and formality of the governmental programme.

Again, many mining claims, owned by prospectors, or miners in a small way, are surrounded by a swarm of nuisances in the shape of rival claimants, blackmailers, &c., who wait to see whether the mines will be valuable, before pressing their various threats. In numerous cases, these parasitic adventurers drop off in the course of time, because there never comes a particular moment when they are willing and ready to fight, or able to force a compromise. We regret to say also, that in many cases, the proprietor only cares to "worry along," till he can make a sale, and leave to his successor all the legal, as well as mechanical, metallurgical and financial difficulties of the enterprise.

Now, the moment an application is made for a government patent, every man who has an adverse claim, however shadowy, may enter his protest, and the most valid counter claim will be null and void, if it is not pressed when due notice is given by the register of the application made. It is evident, then, that to file such an application, is to pull the string to a very shower-bath of vexatious litigation, precipitating difficulties which might otherwise never become troublesome, or at least might be dealt with singly, and gradually overcome or evaded.

Capitalists, about to purchase mining property, always should, and doubtless generally do, demand the absolute security of the United States patent; but in view of the circumstances to which we have alluded, we can hardly be surprised that ordinary proprietors, in peaceful, though perhaps dubious possession, do not feel inclined to turn an armed truce into an uncertain strife. This is one of the points to which attention must be given. It is no easy matter to devise a general mining law, which shall be at once efficient and acceptable.

SUTRO TUNNEL.

We call the attention of our readers to our review of a work on the Sutro Tunnel, to be found under the head of New Publications. In view of the fact that the Company are asking for a loan of bonds from the United States Government, to aid them in the construction of the tunnel, it is very proper that the people should know something of the *testimony* in regard to the value of the enterprise. Out of some twenty letters from the most eminent scientific men in Europe, we have room only for three or four extracts. Those, however, strike the heart of the matter. They show the immense value that will attach to the tunnel in an an economical point of view, as regards the mines along its line, and suggest a still more important feature, namely; the inauguration of a national system of tunnel mining, in contradistinction to the present "*piratical*" process of working down upon veins in search only for rich bodies of ore. That this is a matter of very important national significance, no one who looks into the real merits of the case will fail to perceive. It is a fact clearly proven by the ablest political economists of the day, that the burden of public and private indebtedness decreases in direct proportion to the increase of the precious metals. Let us have, then, a national system of mining, in accordance with principles that have been long acted upon in the conduct of mining enterprises in Europe. It will add millions upon millions to the coin of the world. Under such circumstances, our General Government can do no less than imitate, in this matter, the example set by those governments within whose domain the art of mining has been carried to its highest point of development, and where such undertakings have always been crowned with complete success. We can but believe, then, in this matter, our legislators will look beyond the hue and cry of a partisan press, and act in aid of an interest that, properly fostered, will soon become one of the greatest industries of which our country can boast.

THE END OF VOLUME FIVE.

Last week brought to a close the fifth volume of the AMERICAN JOURNAL OF MINING. In its constantly increasing popularity and patronage, we feel that we have conclusive evidence that every department has been conducted with the success which we promised ourselves in the beginning. It is with feelings of honest pride and satisfaction that we review the

work of the past six months, for we believe that, in the judgment of our readers, we have made substantial progress; that we are at least keeping pace with, if not leading, in the great mining industry of the country. We would call the particular attention of our readers, to the full and systematically arranged index to volumn five, which accompanied our last week's issue. With it, our subscribers have all that is necessary, in order to render the volume complete for binding and reference. And now, at the beginning of another volume, we bespeak for ourselves a continuance of public favor and patronage. It shall be our first endeavor to see to it, that, in every respect, the JOURNAL of MINING maintains a standard fully commensurate with the wants of the mining public.

EDITORIAL CORRESPONDENCE NO. V.

HEAVY BLASTING—DYNAMID.

SAN FRANCISCO, June 5, 1868.

We are here (as the Duke said to his motto) and perhaps hereafter we may feel moved to record our impressions of this metropolis of the Western World. Just at present, however, having gathered, by the courtesy of Col. GEO. H. MENDELL, of the U. S. Engineers, some interesting facts concerning the use of explosives in subterranean operations, we postpone our gossip of personal experience till some day when we have nothing better to relate.

Col. Mendell is in charge of the government works at Alcatraz Island and Lime Point in the harbor of San Francisco, and elsewhere on this coast. In connection more especially with the work of Lime Point, some very successful blasting has been accomplished under his direction. Lime Point and Fort Point are the two side-posts of the Golden Gate, through which the commerce of all creation passing, enters the bay. It is intended to occupy these points with twin forts; and Fort Point, as its name implies, already bears the rose-tinged blossom of the stars and stripes, upon a thorny thicket of bristling guns. At Lime Point, however, there appears, where the fortification should be, a rocky hill, about two hundred and fifty feet in height, and having a facial angle of the Caucasian type, that is to say, somewhat steeper than forty-five degrees. This hill it was necessary to remove, in order to prepare a site. The estimate of cost, made beforehand, demanded a large sum; but the skill and ingenuity of the engineers, and the favorable character of the rock, have already made it evident that the necessary work can be done at comparatively light expense.

About twenty feet above the water, a small tunnel was driven into the hill for sixty feet, and from its interior terminus a second gallery at right angles to the first, and parallel with the face of the hill, was driven for a like distance of sixty feet. Two chambers were excavated in the second gallery, one at its extremity and one about forty-five feet nearer the corner. These two chambers received charges respectively of four thousand and thirty-five hundred pounds of blasting powder, manufactured by the California Powder Company. The charges were connected with each other and with BEARDSLEE'S magneto-electric apparatus outside, and both tunnels were tamped with clay and sand to the mouth. The tamping was tightly rammed. The effect of such a blast of seven thousand five hundred pounds of powder, and the relative economy of the operation as compared with ordinary methods, have as much interest for mining as for military engineers. The state of affairs previous to the blast may be recapitulated thus: The above-named charge of common blasting powder, in two portions, occupied a line fifty feet from the face of the hill. Above it was the weight of two hundred and fifty feet of rock, and behind it a practically immovable mass. The rock is the well-known San Francisco slate, considerably contorted, fractured and decomposed, yet lying, on the whole, so that when the blast should have thrown out the foundation along the line of least resistance, the superincumbent mass, to an unknown extent, might be expected to tumble into the sea. It should be noted that the line of effective work (fifty feet) exceeeded the distance between the two charges (forty-five feet), hence the forces of explosion would meet before they could find vent through the lifted rock. This arrangement secured a maximum effect. The sagacity and accuracy of these calculations was confirmed by the thoroughly successful result. The simultaneous explosion of the two charges was perfectly accomplished. There was no violent noise and no scattering of fragments—in other words, no power was wasted. A little smoke and flame escaped, and the whole lower face of the hill moved silently and majestically outward, falling down into the sea, and followed by immense portions of the overlying rocks. For several hours the effects of the blast continued, until some *forty thousand cubic yards* or *eighty thousand tons* of rock had been displaced, and a large portion of it actually rolled into the sea. The entrance tunnel, up to the point of turning, was left intact, with its tamping, so thoroughly had the force of the explosion been utilized. The tunnel being reopened, a short elbow was made on the side opposite to the former gallery, and a chamber constructed for a second blast of twenty-six hundred and fifty pounds. The tunnel being tightly tamped as before, the blast was fired, with equally favorable results. The rock being considerably disturbed, even where not actually removed, by the first blast, there was naturally more noise; and many small fragments were projected a considerable distance; but this incidental waste of power was compensated by the greater ease with which the masses of rock, already loosened, were moved; and the apparent effect of the second blast was even greater than that of the first. Some twenty thousand cubic yards were added to the forty thousand already displaced. The economical aspect of the case is conclusive enough. A hundred and twenty thousand tons of rock thrown out with two blasts at a cost somewhat as follows:

For tunnels powder and tamping, first blast,.....	$2,000
For reopening tunnel and second blast,.....	500
Total,.....	$2,500

or two and one-twelfth cents per ton! The powder cost ten cents per pound. Labor, about three dollars per day. All these sums are reckoned in coin.

We do not hesitate to say, that no other explosive now known would do as well as this under these circumstances. Both nitroglycerine and dynamid or "giant powder" are far too rapid in their action to be employed where lifting, and not shattering, is the effect desired. In tunnels and shafts, and frequently in stopes, where there is great tension of surrounding rock, and little working face, these violent agents are more in place. The dynamid, by the way, is rapidly disarming the feeling of apprehension so generally entertained towards all forms of nitroglycerine, and coming into extensive use among the mines. The secret of its manufacture is not very profound. The engineers, in opening the tunnels to which we have alluded, employed dynamid which they prepared for themselves, at first by saturating sawdust with nitroglycerine, and afterwards, by substituting for the former material fire sand.

We have already guessed in these columns, that the effect of the mixture was purely mechanical; and this being the case (as the facts now within our knowledge abundantly confirm) it is much better to employ a substance of indifferent inorganic character, like silica, than to absorb the nitroglycerine into organic fibres, which may induce a spontaneous decomposition (not to say explosion) analogous to that of gun-cotton. When sand is used, there is no absorption, but an enfilming of the particles with nitroglycerine, which answers the same purpose.

There is a deposit near San Francisco of infusorial earth, which is sold under the fanciful name of "electro-silicon," as a polishing powder. This fine siliceous earth is admirably calculated for the manufacture of dynamid, and the article, as manufactured by the regular agents here, is apparently (and most probably) nothing more than "electro-silicon," saturated with nitro-glycerine. It is true, that the giant powder has more the appearance of moist saw-dust; but the grains are soft, and pulverulent, like those of moistened flour. This is, we think, the whole of the vaunted mystery; and we make the revelation (for which we claim no credit) with the greater pleasure, because the agents are selling the article at an exorbitant rate, receiving a dollar and a half in gold per pound, while the cost of the manufacture can scarcely amount to fifty cents. In spite of this unwise greed, however, the new powder is in great demand, and its use in many cases effects a great saving. Half-inch bore-holes and single miners are taking the place of the great two-inch drills with "two to strike and one to hold"; and the high cost of dynamid (fifteen times that of powder) does not outweigh the great saving in labor and room which it involves. R.

MINING COMPANY MEETINGS.

Notice is hereby given that a special meeting of the Stockholders of the CHENANGO GOLD AND SILVER MINING COMPANY, of Montana, will be held at their office, No. 4 Broad street, on the 22d inst., for the purpose of electing one Trustee to fill vacancy.

R. M. HAGAMAN, Secretary.

NEW PUBLICATIONS.

THE AMERICAN EXCHANGE AND REVIEW.—The June number of this magazine has made its appearance. It contains a series of interesting articles. The reader who finds his chief pleasure in the perusal of writings upon Ethics and Metaphysics, will undoubtedly find the leading article entitled "Spencer's Social Statistics" a very entertaining one. In it the Question of Social Equilibrim, the Actual and Potential, Empirical Reasoning, the Abstract Reason, Generalization, the Homogeneous and the Heterogeneous, Morality--Actually and Potentially, and other similar abstruse problems are discussed. Under the head of Volcanoes and Earthquakes, we have a dissertation that will be read and appreciated by the scientific, as well as by the popular reader. The article is well-timed, coming as it does when volcanoes are in a state of unusual activity, and the public mind thereby more especially directed toward them. The writer shows that there is an intimate relation existing between the two classes of phenomena. He says: "that both develop themselves mainly along the same zones, and earthquakes are rarer and more feeble as they recede from the centres of volcanic action." There are over four hundred known active volcanoes, and of these there are some two hundred and twenty-eight now in a state of activity. Water, it is observed, plays a most important part in volcanic phenomena, elastic vapors supplying the principal motive force of upheavals. Their remarkable linear distribution is also dwelt upon as one of their most striking features. The following paragraph which we quote, seems to possess a peculiar scientific interest:

"M. Claire Deville, who has made volcanic phenomena his special study, states that there exists a constant and certain relationship between the degree af intensity of an eruption and the nature of the gaseous elements ejected from volcanic apertures. According to this theory, in an eruption of maximum intensity, the predominant volatile product is chloride of sodium accompanied by other products of soda and potassium; in those of a second degree, hydrochloric acid and chloride of iron predominate; in a third class of eruption hydrosulphuric acid and the salts of ammonia prevail; and in the last class of all, nothing is found but steam, carbonic acid, and combustible gases. Thus, complete eruptions are of four degrees of intensity. When a great eruption like the present one of Vesuvius follows in its ordinary decreasing march, it passes successively through these four different phases in proportion as it becomes weaker and weaker.

"The height of the eruptive cone of Vesuvius varies considerably; the most authentic measurements made at various times vary from 3,400 to 4,327 feet. It was formerly asserted that upwards of eighty distinct minerals were to be found in the products of the great subterranean laboratory of this volcano, and though recent careful researches have reduced the number to about forty, the fact remains 'that in an area of three square miles around Vesuvius, a greater number of simple minerals have been found than in any spot of the same dimensions on the surface of the globe.'"

THE MINERAL RESOURCES OF THE UNITED STATES, *and the Importance and Necessity of inaugurating a Rational System of Mining, with special reference to the Comstock Lode, and the Sutro Tunnel in Nevada.* By ADOLPH SUTRO: Baltimore. JOHN MURPHY & Co. 1868.

We have upon our table this book, in which are grouped together all the facts and opinions that have reference to the proposed Sutro tunnel. The matter is capitally arranged. In its more general features the book discusses the Comstock lode, and the evils of our present system of mining. Upon this follow numerous letters from the most distinguished scientific men of the present day; all of whom bear testimony in the most emphatic manner to the great importance that attaches to the *immediate* construction of the Sutro tunnel; and that, too, in many instances not merely from a scientific, but also from a politico-economical point of view. The fact that nearly all the writers of these letters are men now holding the very first scientific positions in the gift of the various governments of Europe, puts the matter beyond all cavil, that the views they have expressed are prompted, neither by feelings of prejudice, nor yet of self-interest, but are the results of mature deliberation upon a question, similar in character to those with which they have but to do in the mining regions of their own country. Then comes the report of the Committee on Federal Relations of the Nevada Legislature. To this succeeds quite an extended dissertation upon the Comstock lode, its character and probable continuance in depth. This paper is written by BARON RICHTHOFEN, and the elaborate statement of his views upon these questions is full of interest. The report to the Mechanics' Institute, of San Francisco, upon the Sutro tunnel project, by a special committee appointed to examine into the facts of the case, is an argument in favor of the prosecution of the work that will stand the test of the severest criticism. In speaking of the necessity of a tunnel to the Comstock lode, the report says:—"We have thus far reviewed the results of mining experience where drain tunnels have not been, and where they have been constructed, and the conclusion your committee arrives at is, that a deep drain tunnel to the Comstock lode will not only greatly facilitate mining operations, *but it is an absolute necessity*; the sooner it is constructed the more benefit will be derived therefrom, and without it nothing is more certain than the abandonment of these mines before the lapse of many years." The remaining pages of the work are taken up by Acts of the Legislature of Nevada, and of Congress, contracts, endorsements, miscellaneous extracts, resolutions, topographical map of the location, and a longitudinal section of the Comstock lode and the Sutro tunnel.

Space will not permit many extracts, but we cannot refrain from giving a few lines from some of the letters that bear witness to the real merit that underlies this mining enterprise. WEISSBACH, Professor at the Mining Academy of Freiberg, and the highest authority in the world upon questions of mechanics, says:—"Such a tunnel removes, *firstly*, the necessity of using pumping engines for many years to come. It facilitates and cheapens, *secondly*, the extraction of ore and waste rock in an extraordinary manner. It gives, furthermore, *thirdly*, many opportunities for additional explanation of the country, and discovery of new bodies of ore. The tunnel also, *fourthly*, makes it possible to derive a profit from the great masses of poor ores. The connecting and air shafts of the tunnel will, *fifthly*, secure to the mines perfect ventilation. Finally, there will be created, *sixth'y*, a motive power, by saving the water on the surface, and conducting it to hydraulic engines, for instance, turbines, water-pressure engines, etc., placed in the mines. The water will flow off in the tunnel level, after having done its duty. This will not only entirely remove the necessity of steam engines, but also promise the greatest profit, particularly if the supply of water can be made to last the year round." VON COTTA, the Professor of Geology at the same school, among other advantages, remarks that the tunnel will facilitate the transportation of ores from the mines, and also the entry and exit of a portion of the miners.

Not less to the point are the words of BRUNO KERL, Professor at the Royal University School of Berlin, when he says:—"Only by means of such a tunnel—as one has, for instance, been constructed in the Hartz, under the name of the Ernst August tunnel, but under circumstances far more unfavorable than yours—can a metalliferous mountain range be opened properly according to the principles of mining engineering; a well-regulated extraction can take place with such a tunnel, and poor ores may be taken out to advantage along with the rich ores, on account of cheap transportation. This is absolutely necessary, if the durability of a mine is to be secured, while *piratical mining*—the extraction of the best ores alone—will always soon ruin any mine."

We would gladly give more from this interesting book, but must close with the remark, that none who are either directly or indirectly interested in the proposed tunnel, should fail to give it a careful perusal. Nor again should a portion of the press, as it evidently has done, declaim against a work of such importance, without at first an examination into all the evidence of the case.

Address of Mr. Raymond Before the California Academy of Science, Monday, June 1, 1868.

[Extract from the report of the San Francisco *Bulletin*.]

* * * * * Further business was suspended until next Monday in order to listen to R. W. RAYMOND, newly appointed Mining Commissioner, who was present and was introduced by the President.

Mr. RAYMOND thanked the Academy for their friendly greeting, and declared that he came here with the sincerest wish to be useful, to observe and to learn. He humorously added that the special business of the Pacific slope for some months would be to instruct him, and he did not speak now from any idea that he could teach others, but because by explaining his mission and the motives and intentions with which he entered upon it, he would be able to prevent misconceptions and avoid the necessity of much speaking hereafter. He did not expect in the time, and with the means at his disposal, to be able to do nearly what he would wish to do. He had only the remnant of old appropriations to work with, and had hurried

from Washington to save time and reach what results he could, rather than wait on the slow progress of impeachment and appropriation bills. His predecessor, J. Ross BROWNE, although not a scientist, had extorted his admiration by the industry and intelligence shown in his very valuable reports, which were in demand to the very last copy. For himself he could not expect to go over the whole field and accumulate a fresh mass of mere statistics, but he should learn as much as he could that was most important to know, and hoped he would have grace given him if he learned nothing to make no report. [Laughter.] He intended to go at once into the mining districts, and wanted it understood that he did not expect to praise or please by any special notices, but meant to do impartial injustice to all. [Laughter.] He would like to devote himself chiefly to science, but his errand was to present plain facts and practical suggestions to legislators ignorant of the whole subject of the mines and mining. His report must be elementary, and of a kind to guide aright the action of Congress. His instructions from the Secretary of the Treasury required him, as among the most important things, to inquire into the special needs of the great mining interest; how it can be encouraged and rendered most productive; how far individual enterprise should be left untrammelled by legislative action, and to what extent, and in what instances Government might properly lend its aid to facilitate the development of the mines, and thus arrest the present annual decrease in the reduction of bullion; what has been the experience of other countries, resulting from the establishment of national institutions for the education of miners; and how far would the systems prevailing in Europe be applicable to our people or appropriate under our Government?

The prosecution of these inquiries would consume the greater part of his time while here until September, when he should go overland from Dacotah. At the outset he was struck with the importance to the country of sustaining the productiveness of our mines of precious metals, not by directory or coercive laws, but by spreading information. He was not an advocate of protective ideas in legislation, but of the largest liberty for individual thought and exertion, conjoined with general diffusion of intelligence. Government should supply the means of intelligence, and all else would come through the energy of the people. In the industry of mining this was particularly needed. Mistakes in that were irreparable, for they destroy the value of the mines.

Mistakes in agriculture may be repaired, for the land remains and can be cropped every year or restored to fertility after impoverishment. Mr. Raymond here drew a fine distinction between the two industries, which he regarded as the great staples of a country's material wealth, and shows that far more precise and thorough knowledge is essential to the economical and profitable working of mines than to the tilling of the soil. His illustrations in this connection were varied, striking and just. He instanced the wasteful and superficial working of many mines as proof of the lack of knowledge on this subject, and as the cause not only of the falling off in our production of bullion, but of the loss estimated by Mr. Browne, which he thought not exaggerated, of 25 per cent. of the metal actually extracted from the mines. Under our imperfect system people go into a district only to rob it a little and spoil it a great deal, leaving behind more than they save, and yet making it generally impracticable to re-work the same ground. The interests of the country demand system and instructed skill in mining, and to insure these a National School of Mines is necessary—not a bureau, which would be a mere government department, but an institution to educate the people. In this national school the practical business of mining should not be taught as a mere branch; he did not think such a branch would bear much fruit; it should be the main thing. He knew California was to have a University, and that it would be a worthy one; but it could not supersede a National School of Mines. Mr. Raymond then alluded to the popular prejudice on the subject of scientific instruction, and to a remark made to him that science is "played out" among the miners on this coast. He did not believe this; and, after all, what is science? Only the record of what has been practically learned. There is a class that superstitiously venerate anybody who has the smell of a German college on his garments, and another with whom to be called a scientist is to be pronounced a humbug. But he believed it was generally true in California that men were taken at their real value, and that while pretension is soon set down, real merit in science and practical business is eventually appreciated. Hence he expected that the idea of scientific instruction in mining would be fairly received, and he courted criticism and counsel on the subject from every quarter. He knew instruction in foreign mining schools, where legislation and custom differ, and are intimately associated with local methods of teaching and working, is not quite adaptable to American needs. Though it is very valuable as a guide to the student, he has yet to recast it all, and suit it to new conditions. Nothing but a National School of Mines could build up an American science of mining. Mr. Raymond spoke at considerable length, with much fluency and eloquence, and we regret the lack of space to report him in his own words. He concluded with a glowing expression of the idea that in the working, thinking masses of the nation, in their enterprise and virtue, controlled and increased by education, resides the best hope of the country. He was warmly applauded, and received the thanks of the Academy.

Mr. Falkenau, on behalf of the Academy, expressed a cordial sympathy with the ideas advanced by Mr. Raymond, and moved that the suggestions as to mining education be made the subject of a special debate. On motion of Dr. Cooper the third Monday in August was fixed for the opening of such debate by an address from Mr. Falkenau.

The Academy then adjourned.

Chemical Nomenclature.

In running our eyes over a scientific periodical the other day we came across the following terrific name—oxyethylendisulphonic acid—and a little further on found a note quoted from M. Dumas, the new Secretary of the *Académie des Sciences*, which, though not cited with reference to anything except general interest, applied most aptly to the interminable word we had puzzled over. "If," says M. Dumas, "every one of us took the fancy of combining with his name that of his great-grandfather, of his grandfather, or his father and his mother, a singular complication would be found in our registry of births. As to knowing the names of the inhabitants of a town, that would be an impossibility. This is, however, what our *savants* who pursue organic chemistry have to accomplish, so that their language has now arrived at a point of barbarism not to be surpassed." This is altogether too true to be a joke. When will some great authority arise and propound to the scientific world a system of nomenclature that will commend itself by simplicity and sufficiency?—*N. Y. Times.*

Original Papers.

[MS. FURNISHED TO THE AMERICAN JOURNAL OF MINING BY HON. J. ROSS BROWNE.]

NOTES ON LOWER CALIFORNIA.—NO. VII.

BY W. M GABB, ESQ., PHILADELPHIA, LATE OF THE CALIFORNIA GEOLOGICAL SURVEY.

VARIOUS RESOURCES OF THE TERRITORY—MINING.

"Prospecting" has been carried on over the whole length and breadth of the country, but, on the whole, without very marked success. In the mica slate range of the South valuable silver mines have been found, and in the "frontiers" a single mine of copper has been opened which promises well.

Of gold mines there have been many, but at the present time not one is being worked. In the granite hills near Cape San Lucas gold has been undoubtedly found, but it seems that the quantity was very small, and the locality is now forgotten. Further North, about San Antonio, there has been some placer mining, on a small scale. Women have washed the gravel of the arroyo in bateas or wooden bowls, obtaining a pittance per day, and the custom has been kept up during the rainy seasons from time immemorial. Some foreigners, who desired to build a dam and wash out the arroyo at once, were refused permission by the authorities, on the ground that it would deprive the women of their time-honored privileges. In the granite mountains from Santa Gertrudis to San Borja, and even in the metamophic sandstones, almost as far South as San Ignacio, there are innumerable tunnels, shafts and "coyote holes," where attempts have been made to find paying quartz mines. They are now, without exception, abandoned. In most cases the veins were found to be unreliable, mere pockets or strings, and even in these the quantity of gold was not sufficient to pay for working.

Similar attempts have been made to discover or develop silver mines. These are reported as existing about San Borja, on the Island of the Guardian Angel, on the main land opposite this island, on the Island of Margarito, and in numberless other places, none of which have ever yielded anything, nor probably ever will.

About forty-five miles below La Paz is the mining district of Trufino and San Antonio. Here there are several veins known, only one or two of which have been sufficiently developed to form a positve opinion as to their real value. Mining has been carried on on all of the veins since the time of the Missionaries, but only for the purpose of obtaining the decomposed surface ores, which could be amalgamated without roasting. The result of this kind of work has been to expose the veins along the greater part of the course, by series of shallow pits honeycombing the surface and rendering travelling across the hills rather perilous to a stranger. These ores (called "azogue" or quicksilver metal) were worked in arastras and amalgamated without difficulty, the silver existing in its metallic state, freed by decomposition of the sulphurets. As soon as the excavations reached the unaltered ores of the deeper part of the vein, known as "fire metal," they were abandoned and new openings made. About nine or ten years ago, however, systematic work was undertaken by a company from Mazatlan, on a couple of mines called the San Pedro and San Nicholas. They have a body of good ore, varying from fifteen inches to three feet, mostly of excellent quality, and have been, for a number of years past, in the habit of shipping the first class ore to Germany. The material shipped averages over $100 per ton of silver, and the expenses of mining, freight and everything up to the time of delivery in Freiberg, amount to about $70. This is too much; the ore could be worked on the spot at a greatly diminished expense; and if the company had their own mill, they could work inferior ores, too poor for shipment, and which are now thrown away. The manner in which the mines are worked is execrable, the person in charge having hardly an idea of the first principles of mining engineering. On the same vein, three or four miles South, are the mines of the Trunifo company. They possess four mines on this vein, and three on another adjoining to, and parallel with the first. Of these, two have been well opened and are yielding the ore now being worked at the mill. The two are the Mendoceña and Molineña. The former is on the summit of a ridge, and was first opened by an inclined shaft or "slope" on the vein. The slope, rarely higher than 20°, was, at the time of our visit, about five hundred and fifty feet deep, with five levels running each way from fifty to five hundred feet. The vein is from eight to fifteen feet wide, and carries throughout a body of ore averaging about, if not over, four feet. The lower fifty feet of the vein had a body nearer five than four feet. The ore does not lie in "chimneys," but in a continuous sheet, extremely uniform both in thickness and quality. It is a compound of various sulphurets, in which antimony and lead predominate. From a series of carefully made assays, Mr. Löhr reports that the average ores, such as are being worked at the mill, contain from $90 to $124 per ton, while picked specimens assayed as high as $225. In the Mendoceña mine alone we computed that there was ore enough exposed on the levels to keep the present twenty-four stamp mill running for over five years, working twenty tons per day. Over nine hundred tons of ore were stacked at the mill, waiting for reduction, and on entering the mine we could hardly tell whence it had been taken. Most of it had really been obtained while doing what is usually counted "dead work" in the mine—sinking the slope and running the galleries. The Molineña is on the same vein and adjoining the Mendoceña, taking in the side of the hill. A tunnel was being run on the vein here, intended to strike the base of the slope of the Mendoceña and form its seventh level. By this means a large amount of hoisting will be avoided, and all necessity for pumping obviated. The other mines of the company are being opened slowly. One on the adjoining vein has already yielded considerable ore of a character different from the other vein. In it, zinc predominates, and the ore is said to be much less refractory than that from the Mendoceña. This company started with a ten stamp mill, and, having ascertained the proper method of working the ores, replaced it by one of twenty-four stamps, which was receiving the finishing touches as we started on our way Northward. Since then the news has been perfectly satisfactory. The last two steamers have brought to San Francisco bullion to the value of upwards of thirty thousand dollars, as the result of about six weeks' actual working of the ores. The company, in justice to itself, should at least double its mill capacity immediately.

Besides these mines, which I have described somewhat in detail because they are the only ones on which work was being actively prosecuted, there are many more on the same veins which have been partially developed and show every evidence of value. Among these might be mentioned more particularly the Santa Maria, the Soledad, and the Fortuna. In each of these are good bodies of ore, identical in character with the Mendoceña, or the Mexican mines. I cannot here give a catalogue of all the mines which are known, or supposed, to be valuable; suffice it to say, that many others have been opened, and that the time will doubtless come when they will be all thoroughly proven. Labor, wood, salt, and in fact all the accessories for the mining and reduction of silver ores, are infinitely cheaper here than in any other part of the United States, and as soon as Lower California shall have fulfilled her "manifest destiny," a new era of life and activity must spring up here, and make this one of the most productive silver districts on the coast.

[TO BE CONTINUED.]

Manufacturing and Mechanical Notes.

No. XXVI.

Signs and Wonders.

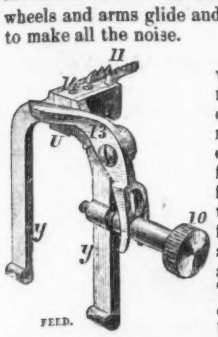
When a man has, or wants business, it is natural enough to suppose that he will make it his business to inform the public that he solicits their patronage, and invites their inspection of his wares. To enable him to do this, the printer offers his services, the news and advertising agents rush to his store and proclaim that now is the acceptable time—but one way to succeed - advertise—to get business—advertise! Behold Barnum, our energetic tradesmen, our successful business men! Whence their success? They advertise, they proclaim their business on the housetops, on rocks and stones, in cars and carriages, by walking advertising mediums, by tinkling cymbal, and blowing of horns, by newspaper, periodical, pamphlet, poster, placard and hand-bills, by signs and wonders which attract attention and impress the memory. There we have it—impress the memory—for who can see a sign-watch suspended in mid air—and not know that a jeweller or watchmaker is at hand, or who can have his eyes dazzled by a golden mortar shining in glorious effulgence, with a keen-eyed

eagle proclaiming to all live Americans that the apothecaries art is to be kept alive, and that there are to be found kill or cure medicines, sugar-coated pills, stirring cathartics, or soothing syrups. How we hail the sign of the apothecary's store when personal or family sickness occurs. How we look for that golden mortar when, bathed in perspiration and fatigued with heat, our thirsty bodies and longing souls cry out for ice cool refreshing beverages! How can we look upon such signs with indifference, and how can we regard the art and skill displayed upon them without wonder and amazement? And yet, visit some of these sign and emblem manufactories, such as that of Washburne's, 708 Broadway, and what do we find? Weather-vanes, wind-wheels and all kinds of aerial-revolutionary objects; signs for hatters, signs for boot and shoe dealers, anvil signs for blacksmiths, mechanics' arms, block letters and figures, and emblems in all variety, carved, embellished, and natural in appearance. We commend these articles to our business men. They go to ornament our stores, and improve the appearance of our streets, and whether they are in the form of a ticking timepiece or compounding mortar, a screaming eagle or a sheaf of wheat, they never appear out of place, and as art approaches the truly graceful forms of nature, so, in proportion, will the human mind and memory be impressed with these appropriate emblems of trade and commerce.

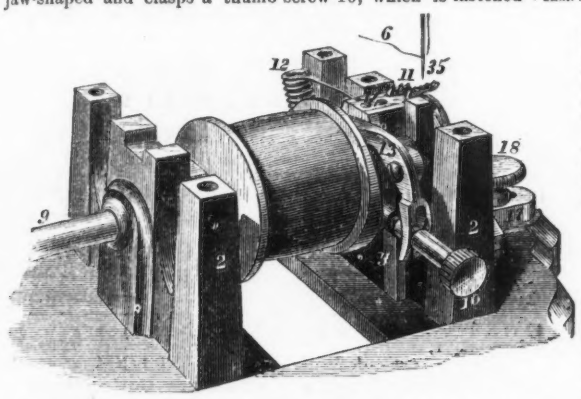
Silent Sewing Machines.

Heretofore our entrance to the magnificent salesroom of WHEELER & WILSON has been greeted by the musical click of their sewing machines, intermingled with the song of birds and the hum of pleasant voices. Alas! the change!! An *improvement* has hushed that silver tongue. Silently the

wheels and arms glide and glitter, leaving its pretty mistress to make all the noise.



Nearly every one is acquainted with the general working of this machine, so that a brief description of this really important improvement will be readily understood. It consists in changing the manner of feeding the cloth to the needle. The former mode of "feeding" was by teeth as shown at 11 in the cut, fastened to a "feed bar" passing along over the pulley and pushed above the plate at every revolution. This bar was moved forward by a cam on the pulley and drawn back by a spiral spring at the end over 9. The rapid motion of this bar caused the only noise heard when the machine was at work. As arranged at present, while the feed motion is precisely the same, the mechanism required to produce it is greatly changed. A small yoke *y y*, to which is attached the plate, holding the "feed points" 11, is slipped over the pulley, which is shortened for the purpose. This yoke at U rests on a cam formed on the end of the pulley. Attached to this yoke by a screw, is a movable arm or lever 13. The upper end of this lever presses against an irregular surface on the side of the pulley, while the lower is jaw-shaped and clasps a thumb screw 10, which is fastened



into one of the legs of the yoke. The yoke is held in place by the end of a spiral spring 12, which rests in a slot of the feed-plate at 14. In working, as the pulley is turned the cam on it raises the yoke *y y*, thus lifting the feed points above the cloth plate. At the proper time the points are pushed forward the required distance for a stitch, then, dropping below the surface by the pressure of the spring 12, is, by the same spring drawn back to place in readiness for the next turn of the pulley. By turning thumb screw 10, a shorter or longer stitch can be produced at will. The perfect simplicity of this motion is only equalled by the rare excellence with which it accomplishes its object—*Silence!*

Type Making.

What an epoch is marked in the history of the world by the invention of printing! The triumph of mind over matter was from that day insured. But even early printers did not conceive the idea of such perfection of workmanship, and speed in execution, as our countrymen have attained. But quick performance in any particular sphere of manual labor is but a secondary consideration where extreme accuracy and perfection are to be attained. This remark is especially true in the art of printing; the manipulation of type and the appearance of letter-press. We Americans are known the world over as being great readers, and yet how few out of the almost innumerable throng ever reflect upon the amount of labor which has to be expended on one little insignificant piece of type. And yet, reader, you should know that each letter and sign and mark has to undergo many operations before it is ready for the hand of the compositor. A visit to the type-foundry of HAGAR & Co., No. 38 Gold street, New York, would convince our readers who are not initiated in the art of type founding, that this branch of business is a highly important one, as the beauty of letter-press depends upon the excellence and perfection of the type. The works of this Company were established in the year 1818. The head of the establishment was then William Hagar, since deceased. The business is now carried on by his two sons, William and John Hagar. The buildings are four stories in height, and are arranged in several compartments. In the casting room the type metal is prepared from lead, antimony and tin, and poured into moulds or pans 14x8x1½ inches deep, which of course give the size of the pigs of metal. These latter are broken up into smaller portions and melted again in casting machines which from this melted metal cast and form one type at a time. This is done with great rapidity and precision. The type is then passed to "breaker boys" who take off the superfluous metal on the ends of the type. From them it is transferred to the dressing room where it is rubbed on sand stones in order to get it bright, even and smooth. The type is afterwards set in sticks about 3 feet long and given to an operator who, with a hand tool planes off the rough ends of the type. The different kinds of type are put up in packages from 6½ to 7 lbs. weight, and then packed in boxes for transportation, or carried to the warerooms. Here may be seen type of all descriptions, systematically arranged. For instance some packages of "Roman font" are observed to be marked "200, E—9, Long Primer," which indicates that there are 200 lbs. of type. E—9 is the name of the mould and face corresponding to the specimen book. In a large fire-proof safe are 80,000 "matrices" or moulds for the casting machines, and 400 different kinds of type. The proprietors, HAGAR & Co., employ about 100 hands, and exhibit enterprise and liberality in having a separate apartment for getting up their own specimen books of printing types, ornaments, etc. These specimen books are got up in the most elaborate manner, and furnish estimates for small and large job offices, for weekly newspapers of various sizes, and contain numerous cuts and description of labor-saving quotation furniture, labor-saving rules, etc., and much more useful information upon subjects important to publishers and printers.

Special Scientific Brevities.

☞ Undoubtedly some one of our readers are interested in aeronautics. For their benefit we announce the prizes to be awarded by the English Aeronautic Society at their approaching exhibition in the London Crystal Palace:

For the best form of kite or other aerial contrivance for establishing communication between ship and shore, in the case of a wreck, or between two vessels at sea, $250.

For a machine whatever may be its motive power, which shall sustain itself in the air at a hight not less than ten feet from the ground for a period of twenty minutes, $250.

For an apparatus (not a kite or balloon) that shall ascend with a man to the hight of 120 feet, $500.

For the lightest engine in proportion to its power, whatever the power may be, $250.

☞ The State Geologist, of Illinois, has just received the first instalments of European fossils, in Exchange for those forwarded to the Paris Exhibition from that State. It consists of seven hundred and sixty specimens from the Permian formation of Europe, and comprises as perfect and complete a set as could be made out. They were from the collection of Prof. Geivity, director of the Royal Museum in Saxony. Another box of paleozoic fossils has been for some weeks on the way from the same place, and was expected daily.

☞ At the last sitting of the Academy of Sciences in Paris, a paper was sent in by M. Bouloy on a new constant current pile. It differs from Daniell's in the respect that sulphate of copper is mixed with its volume of nitrate of potash, which prevents the formation of the usual metalic mushroom deposits on the copper pole, and that the sea salt which is to attack the zinc is mixed with thirty per cent. of its weight of flour of sulphur, whereby the reduction of the sulphate on the zinc is prevented.

☞ It appears that the steel tubes of the Woolwich guns, although hardened in oil, will not withstand the action of the powder and the bite of the shot. In many cases the steel tubes have been deeply scored, and it is a question which, we believe, has been seriously mooted, whether they shall not, in future, be wholly abandoned.—[Engineering.

☞ Kohn, an engineer in Berlin, gives the following as a method of effectually stopping up a porous cylinder cast for a hydraulic press. The cylinder is to be heated over a charcoal fire to about 170 degs. Fahr. It is to be filled up with resin and suspended by a crane over the fire until the liquefied resin is seen sweating through on the outside. The excess of resin is then poured out and the cylinder allowed to cool, when the pores will be found completely stopped, and no water can possibly pass.

☞ A recent sitting of the Academy of Sciences in Paris, the result of an analysis of a chromiferous kind of cast iron, from Medellin, South America, was communicated. It is whitish, composed of minute scales, and of a density equal to 7.45. It is very hard, and is used for stampers to crush auriferous quartz, probably owing to the existence of about two per cent of chromium.

Gndit about Minerals, &c.

☞ The arching with brick of the west end of the Hoosac tunnel, the most difficult work connected with this great enterprise, has been successfully completed. It is 30 feet high, 20 feet wide, and 670 feet long, and is built through a mass of earth and rock, completely saturated with water, which is of the consistence of porridge or quicksand.

☞ Mr. Z. W. Chase, while prospecting in Colorado during the last year discovered, near Breckinridge, Summit County, a silver lode bearing galena. He states that the vein is about six feet in width, and that an average sample of the ore, analyzed by Dr. Charles T. Jackson, contained a little over 3 per cent. of the metal Thallium.

☞ The discovery of a large bed of porcelain clay in Pope Co., Southern Illinois, promises to inaugurate a new branch of industry, and develope an important source of prosperity in that county. The clay resembles magnesia, and produces a ware rivalling, if not surpassing, the iron stone of Liverpool.

☞ Forty-five miles of steel rails are laid on the Lehigh & Susquehanna Railroad, connecting with the North Pennsylvania Railroad at Bethlehem. The *Times* of that place says: "There was not a broken rail caused by the trains between Mauch Chunk and Easton dering the entire winter."

☞ It is said that the consumption of petroleum is decreasing in England. The consumption in January and February, 1868, amounted to 1,519 barrels, against 2 131 for the same period in 1867, and 2,300 for the first two months in 1866.

☞ About seven miles from the city of Fond du Lac, Wis., in the town of Lamartine, is situated a peat marsh of about 1,000 acres, with a depth of peat of from 10 to 20 feet.

☞ Whitesides County, Illinois, has a peat bed six miles long, three fourths of a mile wide, and from twenty to thirty feet deep. The peat readily sells for $7.

All Sorts.

☞ Galignani has the following: "M. Gaudin is said to have made a chemical discovery which may cause quite a revolution in jewelry. He has succeeded in obtaining crystallized masses that may be cut into any shape and colored in every possible way. They are exceedingly hard and will cut glass. It is asserted that he has had a whole set of 'diamond' earrings, bracelets and necklaces made with these crystals of his."

☞ The shipments of bar and sheet steel made in Pittsburgh, during the last three years, were $31,053,507 pounds. About two-thirds of this amount was sent to Eastern markets.

☞ An English magazine estimates the Wall street money business at between $15,000,000,000 and $16,000,000,000 a year.

☞ A NEW Mormon Bible has just been published in Plano. First edition 5,000 copies. No advertisements were inserted.

☞ 2731 words in one hour is the highest rate of speed ever attained it telegraphic transmission in this country.

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The Troy Mine has been opened to the depth of 322 feet, and has paid a profit over and above working expenses during the past four months, and is now producing the richest ore of any mine on Lander Hill. It has been opened sufficient to prove that it is a permanent vein, and with further development, can be made one of the most successful mining enterprises in the State of Nevada. The Company transfer, with each Bond sold, ten shares of its Capital Stock (the par value of which is $100 per share) to the purchaser, without charge, free from assessment or further tax. The money realized by the sale of these Bonds, with the amount the Company now have on hand, will give them ample means to fully develope the Troy Mine, and realize large profits at a very early day. For further information apply at the Office of the Company.

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je27:4t S. R. HUTCHINSON, Secretary.

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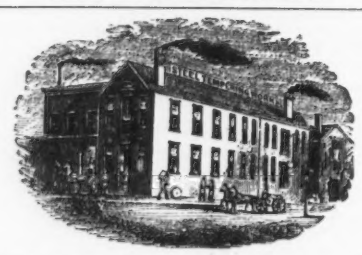

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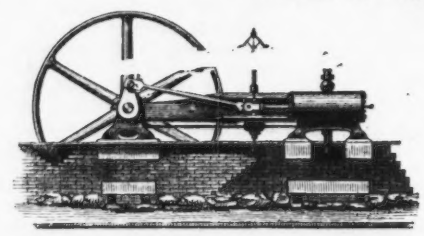

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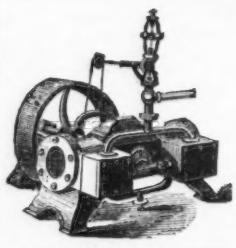

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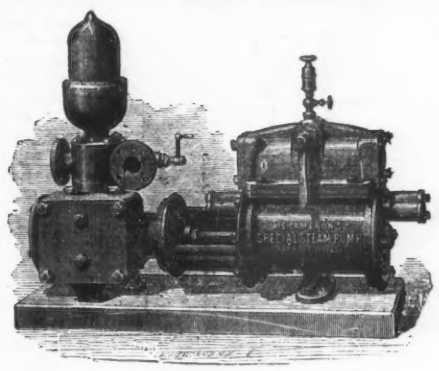

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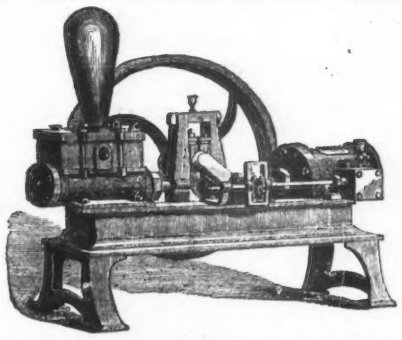

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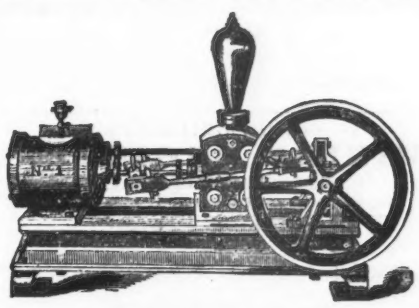

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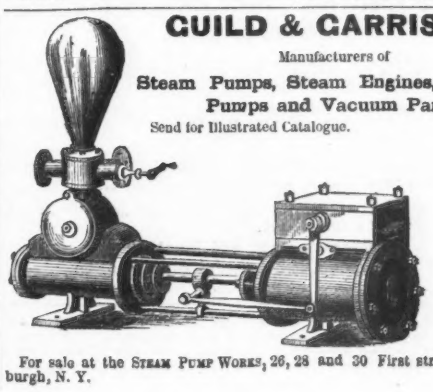

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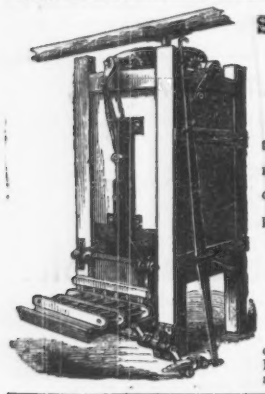

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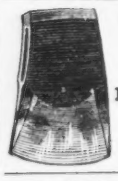

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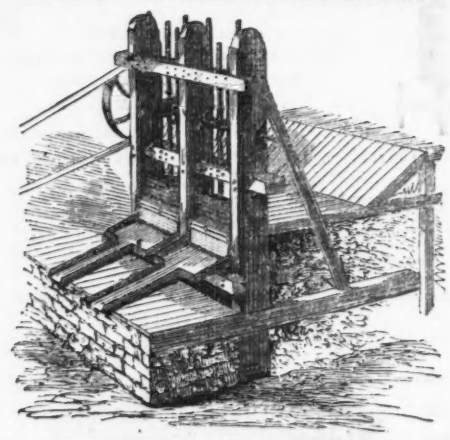

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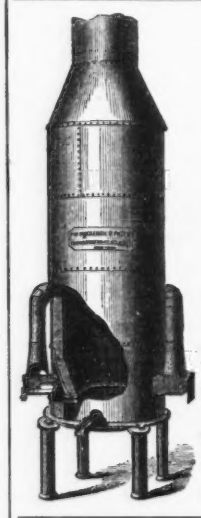

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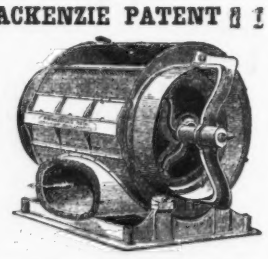

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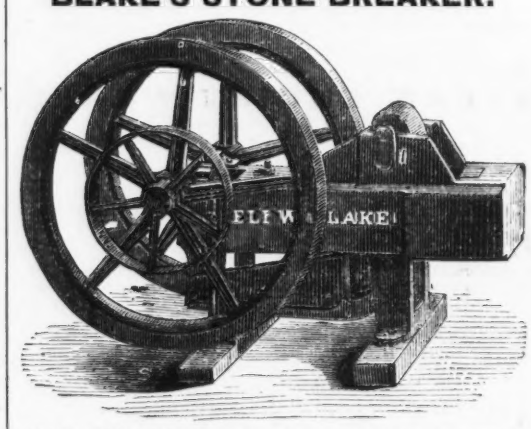

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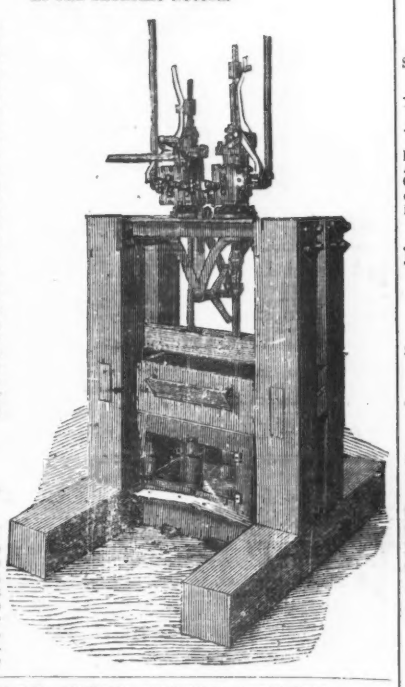

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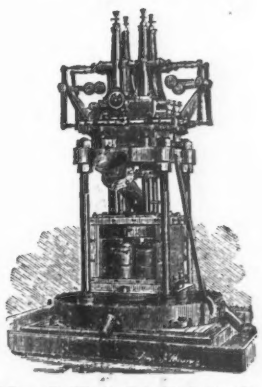

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The Mount Cenis Road

A correspondent of the London *Times*, writing of the trial trip over the finished part of the Mount Cenis Road, says: "Some of the worst bits of the line, the steepest gradients, the sharpest curves, the most appalling glimpses down precipices and into rugged ravines, where the train if overthrown into them, would most assuredly be smashed into splinters, occur within the first few miles after leaving Susa. But the new-comer on the line contemplates these without emotion. No unpleasant sensation of peril distracts his attention from observation of the engineering skill and resource displayed in the construction of the line, or prevents his enjoying the beauties of the mountain scenery. He feels like one drawn along a difficult road, but from whose mind every timorous sensation is banished by seeing how completely the strong and skillful driver has his horses in hand, directs them at will, curbs them with a finger. And, indeed, it is this curb power which constitutes one of the greatest marvels of the Fell system. When going twelve miles an hour down gradients of one in twelve, the brakes are applied, the perpendicular wheels cease to turn, the horizontal wheels clip the central rail with hundred-vice power, and within some thirty yards the train is brought to a complete stand-still without the slightest shock or concussion. It would be impossible to employ such power as would bring the train up short, and produce all the effects of a railway accident. Danger from avalanches has been guarded against by covered ways, some in masonry—where stones and pieces of rock are apt to fall—and others of iron roofing. The adoption of this plan has enabled the constructors of the line to make use of a considerable part of the old road over the mountain, a gradual ascent which was abandoned for a zig-zag line on account of the danger to passengers from avalanches and falling stones. Exclusive of several short tunnels, the road is covered in for a distance of altogether nearly six miles, in several places on each side of the summit of the mountain. The time hitherto employed (in the various trial trips recently made) in getting across the mountain has been a little over four hours of actual locomotion. But stoppages are inevitable, chiefly for the purpose of watering the engine, and the journey will hardly take less time than five hours and a half, at least under present arrangements. It is a great object to economise weight, and consequently much water cannot be carried. The opening of the line to the public is fixed for the 8th of June. The trains will be of several kinds—first-class, express, ordinary trains, and goods trains. The maximum number of carriages will be five or six, with one or two luggage vans. The carriages are upon the omnibus plan, and one travels sideways. The width of the carriages is six and one-half feet, outside measurement. By means of small platforms outside the doors, which are at each end of the carriages, one may walk through the whole train. In general there will be a luggage van between the foremost carriage and the engine, so as to protect the passengers from the heat."

Life in Mining Towns.

The history of mining towns the world over seems to be the same. In the early period it is usual for rough specimens of humanity to flourish and take a prominent place in society. The absence of woman's refining influence, and the softening and restraining effect of religion, gives a kind of license to these characters which is not often neglected. This period generally winds up with a tragedy or two, somebody is hung, and the spirits of kindred proclivities are awed into decency. Georgetown has passed this first period, and is now entering on the second. Churches are now being organized, and a great majority of the people pay respect to the Sabbath. When Sunday comes they seem to divest themselves of the cares and troubles of daily life, and show by their apparel and deportment that they belong to a Christian nation. Society is settling gradually down to respectability. We are glad to mark this change, for we confess to a weakness for the good old customs of our fathers. We express this feeling of satisfaction without affectation or hypocrisy, simply as a practical man of the world, for if we were positively certain in our mind that religion was all a tissue of superstitious fables, we must still acknowledge its good effects, its refining and elevating influence. The wholesome restraint of Christianity upon the people of America, is better and more effective than the strongest police which could possibly be organized. Napoleon, who did not believe in religion, who was a professed unbeliever, found it necessary, when called to govern a nation which had altogether discarded religion, to gradually lead the people back to what he considered their old superstitious customs. He was a man of policy, and being better skilled in the art of governing than most men, adopted generally the wisest plan to control his people.

The scenes of violence and bloodshed which so frequently mark the early history of mining towns, give a striking illustration of what mankind would be without religion, and should incline all good citizens to patronize and support it, whether they are regular church members or not.—*Colorado Herald.*

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